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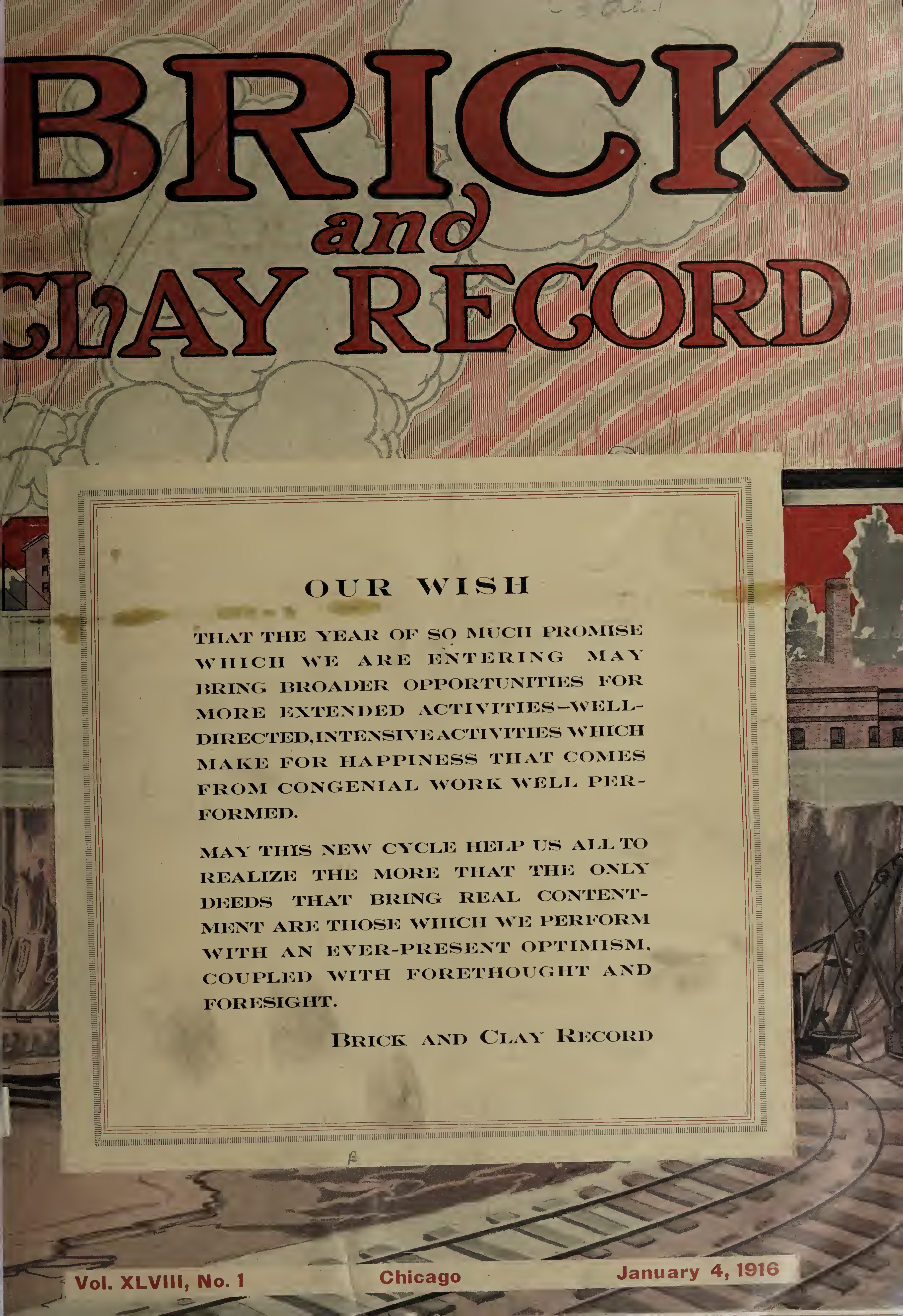
BRICK and CLAY RECORD



OUR WISH

THAT THE YEAR OF SO MUCH PROMISE WHICH WE ARE ENTERING MAY BRING BROADER OPPORTUNITIES FOR MORE EXTENDED ACTIVITIES—WELL-DIRECTED, INTENSIVE ACTIVITIES WHICH MAKE FOR HAPPINESS THAT COMES FROM CONGENIAL WORK WELL PERFORMED.

MAY THIS NEW CYCLE HELP US ALL TO REALIZE THE MORE THAT THE ONLY DEEDS THAT BRING REAL CONTENTMENT ARE THOSE WHICH WE PERFORM WITH AN EVER-PRESENT OPTIMISM, COUPLED WITH FORETHOUGHT AND FORESIGHT.

BRICK AND CLAY RECORD

Vol. XLVIII, No. 1 Chicago January 4, 1916

WELLER-MADE

An essay on—
Back behind the Plant

NEXT YEAR
WET CLAY
DRY CLAY
ENOUGH CLAY
WHICH?

Reckoning time has come—and in reviewing the causes for success—or failure on your plant—you will without doubt find that a good big portion of your success—or failure, can be traced to the ability—or the inability, of the pans to furnish an unfailing supply of ground clay.

Pan output is a function of success.

No system of grinding will permit of capacity grinding—if the clay is wet.

An elaborate efficient grinding system is powerless—useless if there is no material to grind.

If it rains—the clay is wet.

If there is a pit strike or shovel breakdown—there is no clay.

To install an **adequate storage, reclaiming and conveying system** immediately is common sense.

We know how and do build the clay storage system best fitted for your plant.

Tell us your problems and let us help you.

WELLER MFG. CO., CHICAGO

NEW YORK
50 Church St.

BALTIMORE
Garrett Bldg.

SAN FRANCISCO
316 Rialto Bldg.

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BRICK and CLAY RECORD

A Semi-Monthly Record of the World's Progress in Clay-working

* * *

Published on the First and Third Tuesdays in Each Month by the

Kenfield-Leach Company

445 Plymouth Court, Chicago

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Cable Address Kenleaco, Chicago

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Telephone Harrison 951

Chicago, January 4, 1916

Vol. XLVIII No. 1

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Entered as Second Class Matter January 2, 1911, at the Postoffice at Chicago, Ill. Under the Act of March 3, 1879

* * *

Terms of Subscription:
One Year, (24 Numbers)
U. S. . $2.00
Foreign 3.00

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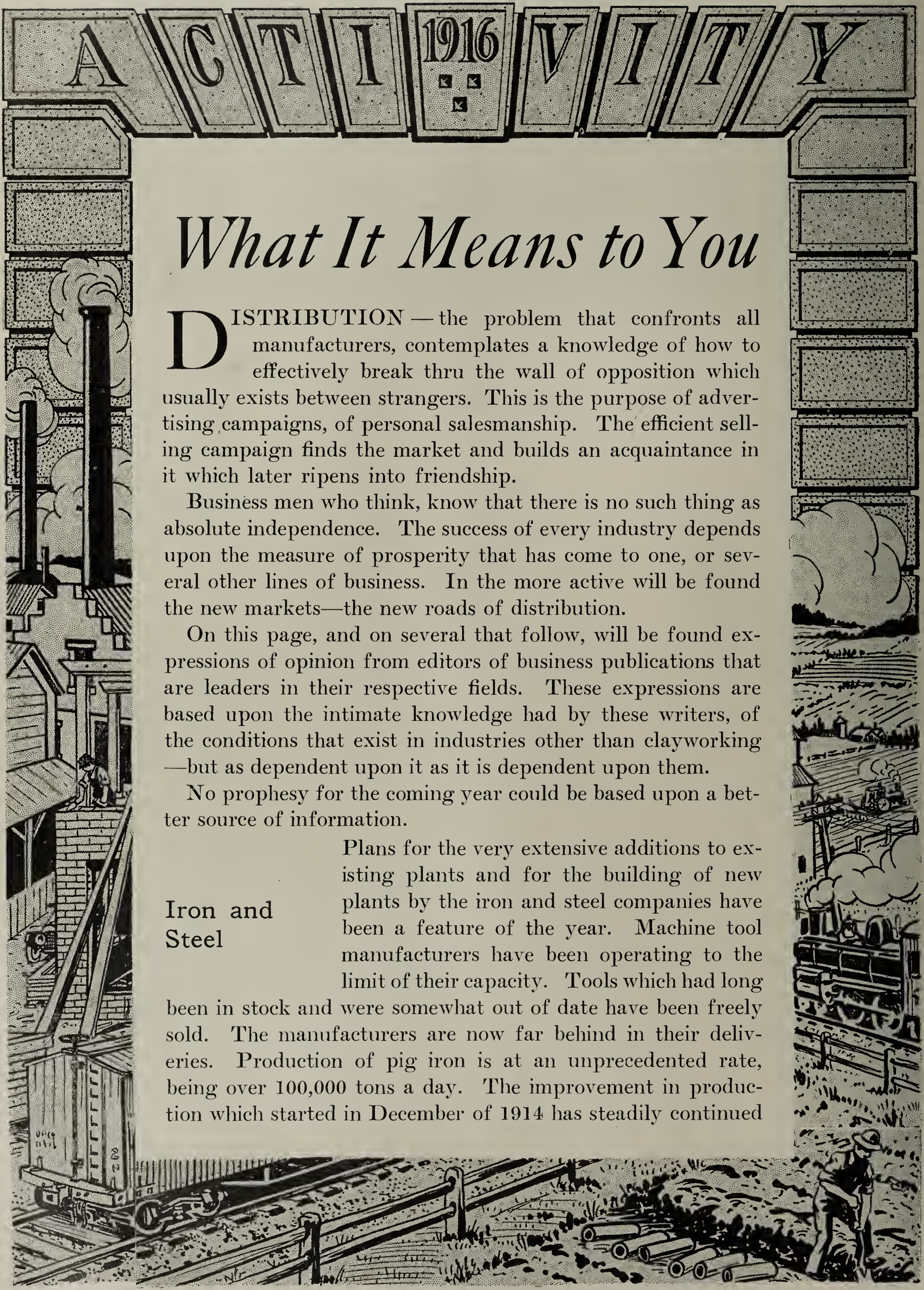
Single Copies, 20c



What It Means to You

DISTRIBUTION — the problem that confronts all manufacturers, contemplates a knowledge of how to effectively break thru the wall of opposition which usually exists between strangers. This is the purpose of advertising campaigns, of personal salesmanship. The efficient selling campaign finds the market and builds an acquaintance in it which later ripens into friendship.

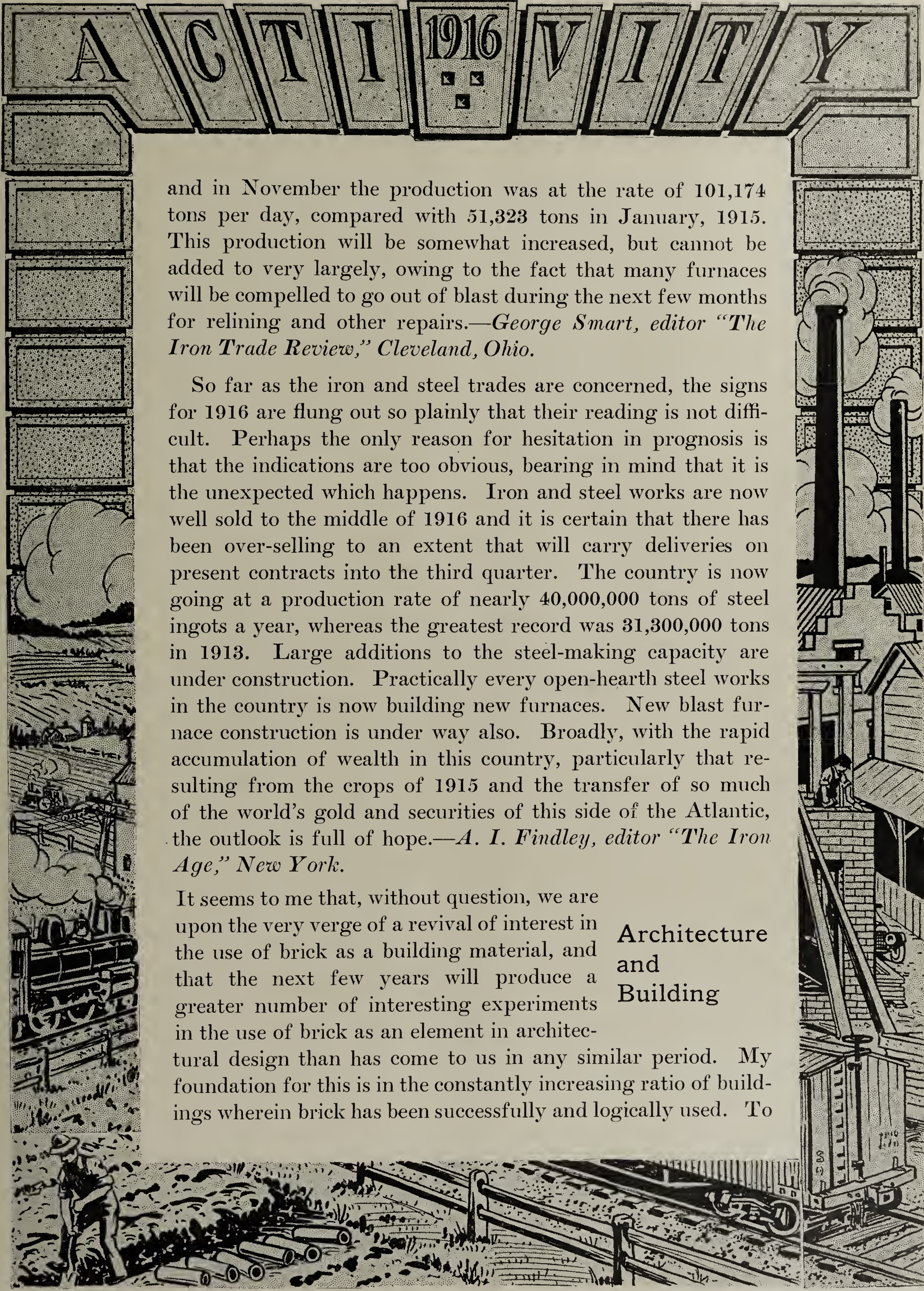
Business men who think, know that there is no such thing as absolute independence. The success of every industry depends upon the measure of prosperity that has come to one, or several other lines of business. In the more active will be found the new markets—the new roads of distribution.

On this page, and on several that follow, will be found expressions of opinion from editors of business publications that are leaders in their respective fields. These expressions are based upon the intimate knowledge had by these writers, of the conditions that exist in industries other than clayworking—but as dependent upon it as it is dependent upon them.

No prophesy for the coming year could be based upon a better source of information.

Iron and Steel

Plans for the very extensive additions to existing plants and for the building of new plants by the iron and steel companies have been a feature of the year. Machine tool manufacturers have been operating to the limit of their capacity. Tools which had long been in stock and were somewhat out of date have been freely sold. The manufacturers are now far behind in their deliveries. Production of pig iron is at an unprecedented rate, being over 100,000 tons a day. The improvement in production which started in December of 1914 has steadily continued

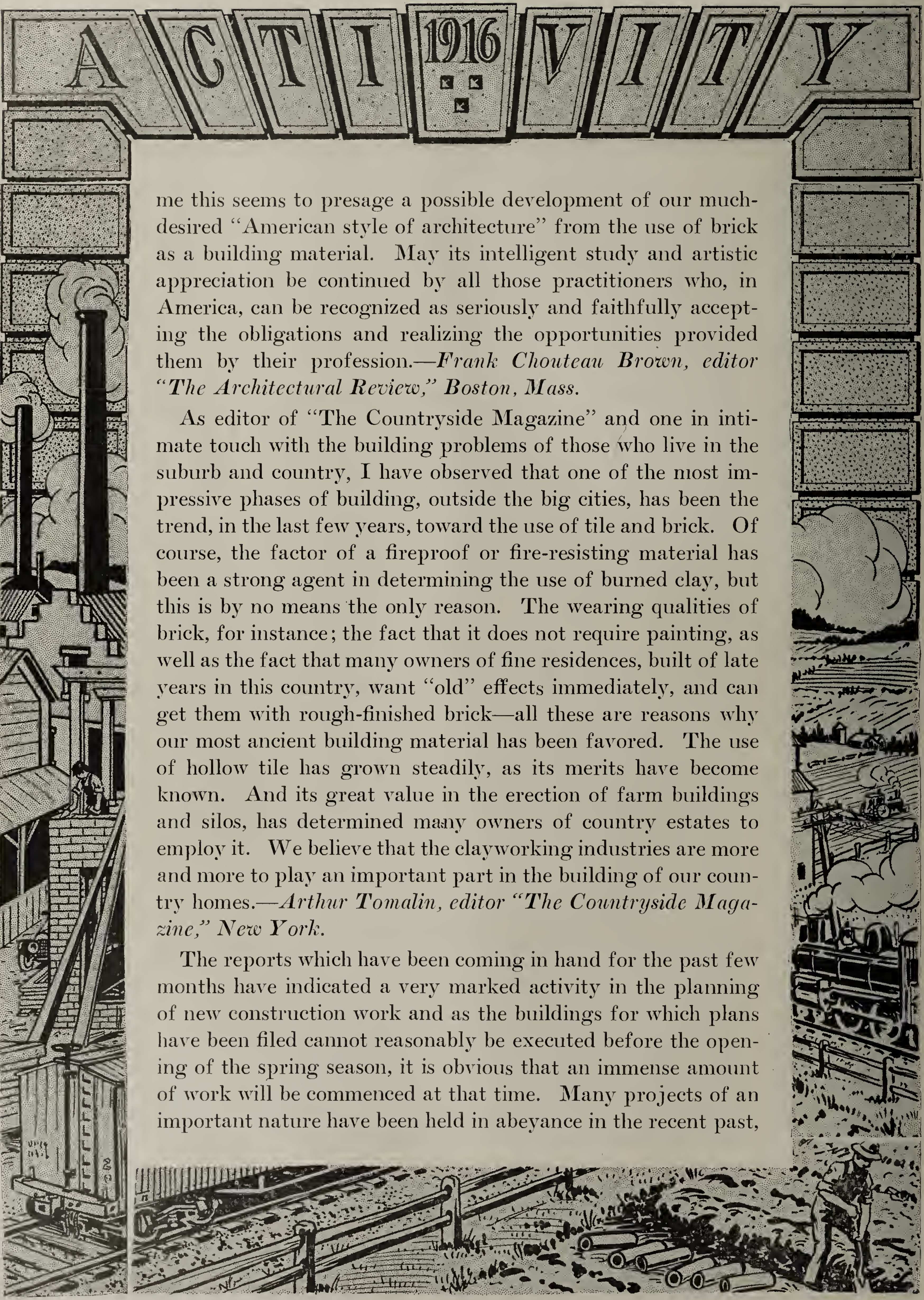


and in November the production was at the rate of 101,174 tons per day, compared with 51,323 tons in January, 1915. This production will be somewhat increased, but cannot be added to very largely, owing to the fact that many furnaces will be compelled to go out of blast during the next few months for relining and other repairs.—*George Smart, editor "The Iron Trade Review," Cleveland, Ohio.*

So far as the iron and steel trades are concerned, the signs for 1916 are flung out so plainly that their reading is not difficult. Perhaps the only reason for hesitation in prognosis is that the indications are too obvious, bearing in mind that it is the unexpected which happens. Iron and steel works are now well sold to the middle of 1916 and it is certain that there has been over-selling to an extent that will carry deliveries on present contracts into the third quarter. The country is now going at a production rate of nearly 40,000,000 tons of steel ingots a year, whereas the greatest record was 31,300,000 tons in 1913. Large additions to the steel-making capacity are under construction. Practically every open-hearth steel works in the country is now building new furnaces. New blast furnace construction is under way also. Broadly, with the rapid accumulation of wealth in this country, particularly that resulting from the crops of 1915 and the transfer of so much of the world's gold and securities of this side of the Atlantic, the outlook is full of hope.—*A. I. Findley, editor "The Iron Age," New York.*

Architecture and Building

It seems to me that, without question, we are upon the very verge of a revival of interest in the use of brick as a building material, and that the next few years will produce a greater number of interesting experiments in the use of brick as an element in architectural design than has come to us in any similar period. My foundation for this is in the constantly increasing ratio of buildings wherein brick has been successfully and logically used. To



me this seems to presage a possible development of our much-desired "American style of architecture" from the use of brick as a building material. May its intelligent study and artistic appreciation be continued by all those practitioners who, in America, can be recognized as seriously and faithfully accepting the obligations and realizing the opportunities provided them by their profession.—*Frank Chouteau Brown, editor "The Architectural Review," Boston, Mass.*

As editor of "The Countryside Magazine" and one in intimate touch with the building problems of those who live in the suburb and country, I have observed that one of the most impressive phases of building, outside the big cities, has been the trend, in the last few years, toward the use of tile and brick. Of course, the factor of a fireproof or fire-resisting material has been a strong agent in determining the use of burned clay, but this is by no means the only reason. The wearing qualities of brick, for instance; the fact that it does not require painting, as well as the fact that many owners of fine residences, built of late years in this country, want "old" effects immediately, and can get them with rough-finished brick—all these are reasons why our most ancient building material has been favored. The use of hollow tile has grown steadily, as its merits have become known. And its great value in the erection of farm buildings and silos, has determined many owners of country estates to employ it. We believe that the clayworking industries are more and more to play an important part in the building of our country homes.—*Arthur Tomalin, editor "The Countryside Magazine," New York.*

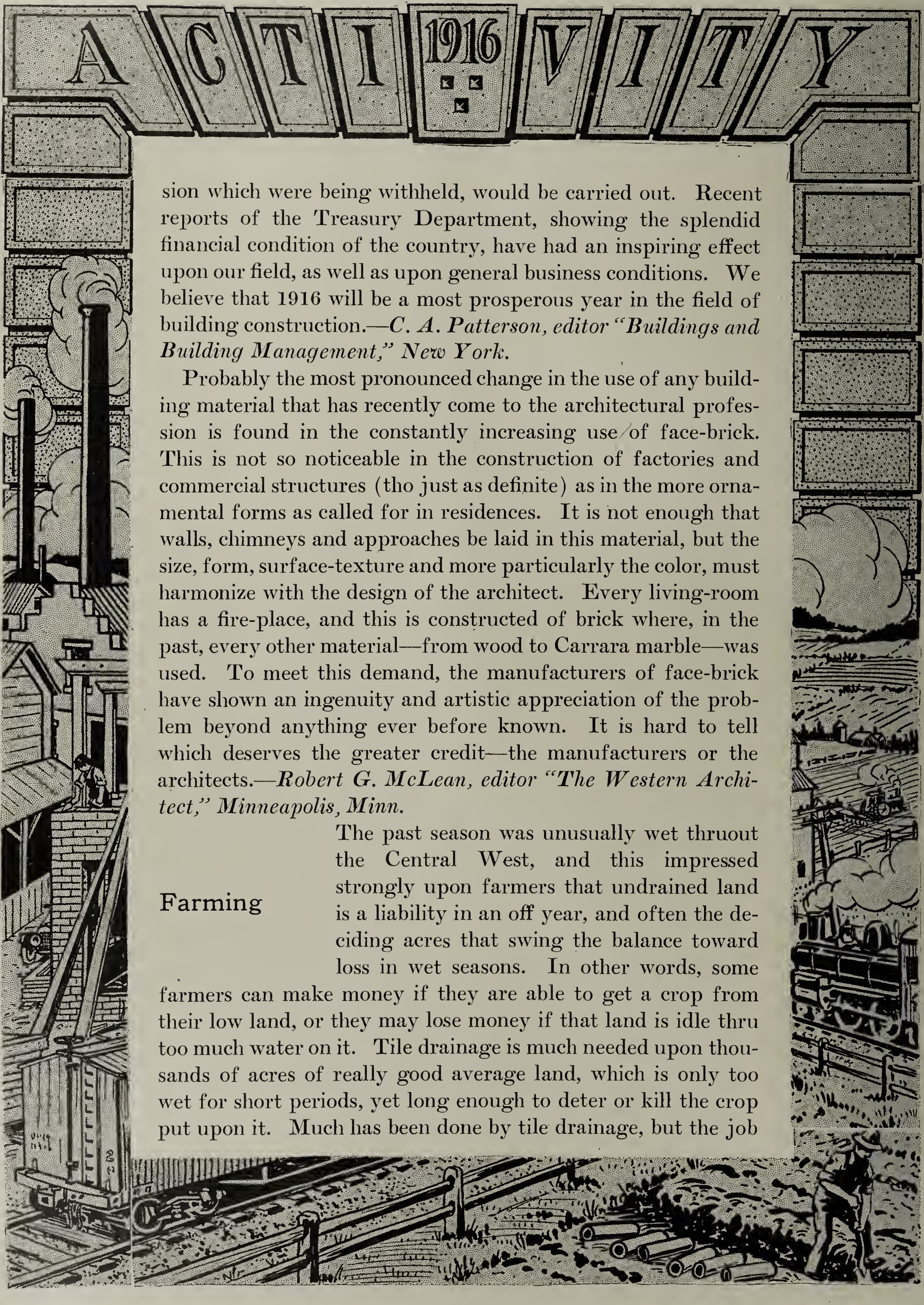
The reports which have been coming in hand for the past few months have indicated a very marked activity in the planning of new construction work and as the buildings for which plans have been filed cannot reasonably be executed before the opening of the spring season, it is obvious that an immense amount of work will be commenced at that time. Many projects of an important nature have been held in abeyance in the recent past, it being estimated that in New York City alone, something like Seventy-five Million Dollars' worth of contracts were being held back in November for a more propitious season. These are likely to be released with the opening of spring and there is every indication of a busy period for all branches of the building industry.—*Henry Colwell, editor "Building Age," N. Y.*

The country is on the eve of the biggest business advancement in its history—an advancement that will spell prosperity thruout the land. The architects are already beginning to feel it in the way of preliminary work, the results of which will later show thruout the building trades.—*A. Holland Forbes, editor "Architecture," New York.*

Architects report more work outlined for residences, churches, schools and other structures than for several years passed; mill and factory owners are being compelled to increase their facilities; Pittsburgh's new building code will embody such construction features that brick will dominate more than ever; workmen are drawing better wages today than ever before and can afford to live in better constructed houses. Every indication makes the Nineteen Sixteen outlook promising for the maker of burned clay products.—*S. A. McRoberts, editor "The Construction Record," Pittsburgh, Pa.*

The increasing use of brick in house construction has come about—and an increase has come about—thru more and more people understanding the artistic possibilities in the use of that medium. Houses are built to live in and to look at—as homes and as integral parts of a community's fabric. For both purposes they must be built of lasting materials and built for good effects. Brick supplies these to disiderata—practical and esthetic. That is why its increased use is logical, founded on common sense and good taste. With such a foundation its popularity only needs time to develop.—*Richard Wright, editor "House and Garden," New York.*

There is more or less activity in the field of big building construction and we have, within the past two months, been receiving advices from our readers that plans for constructive expan-

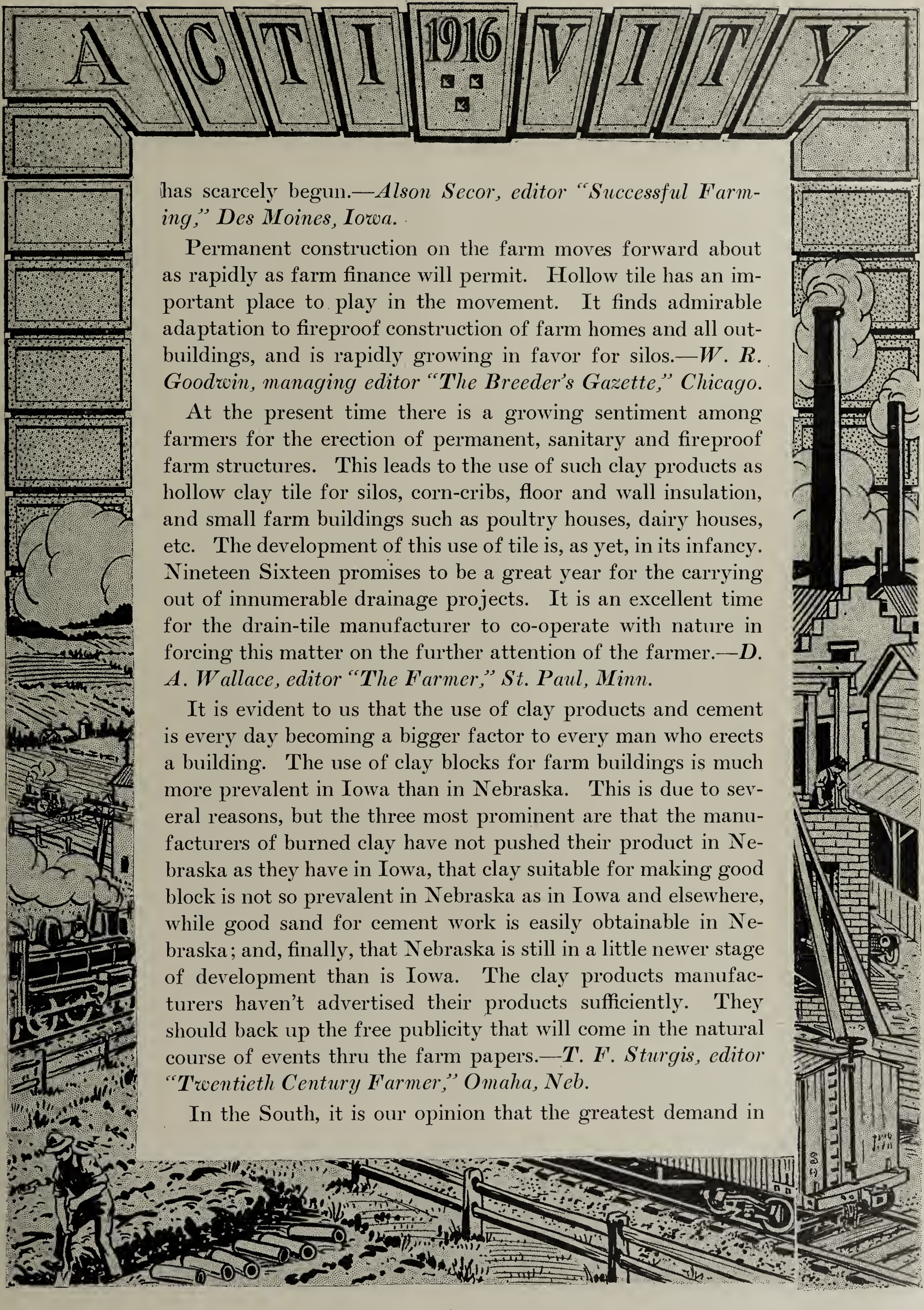


sion which were being withheld, would be carried out. Recent reports of the Treasury Department, showing the splendid financial condition of the country, have had an inspiring effect upon our field, as well as upon general business conditions. We believe that 1916 will be a most prosperous year in the field of building construction.—*C. A. Patterson, editor "Buildings and Building Management," New York.*

Probably the most pronounced change in the use of any building material that has recently come to the architectural profession is found in the constantly increasing use of face-brick. This is not so noticeable in the construction of factories and commercial structures (tho just as definite) as in the more ornamental forms as called for in residences. It is not enough that walls, chimneys and approaches be laid in this material, but the size, form, surface-texture and more particularly the color, must harmonize with the design of the architect. Every living-room has a fire-place, and this is constructed of brick where, in the past, every other material—from wood to Carrara marble—was used. To meet this demand, the manufacturers of face-brick have shown an ingenuity and artistic appreciation of the problem beyond anything ever before known. It is hard to tell which deserves the greater credit—the manufacturers or the architects.—*Robert G. McLean, editor "The Western Architect," Minneapolis, Minn.*

Farming

The past season was unusually wet thruout the Central West, and this impressed strongly upon farmers that undrained land is a liability in an off year, and often the deciding acres that swing the balance toward loss in wet seasons. In other words, some farmers can make money if they are able to get a crop from their low land, or they may lose money if that land is idle thru too much water on it. Tile drainage is much needed upon thousands of acres of really good average land, which is only too wet for short periods, yet long enough to deter or kill the crop put upon it. Much has been done by tile drainage, but the job


A C T I 1916 V I T Y

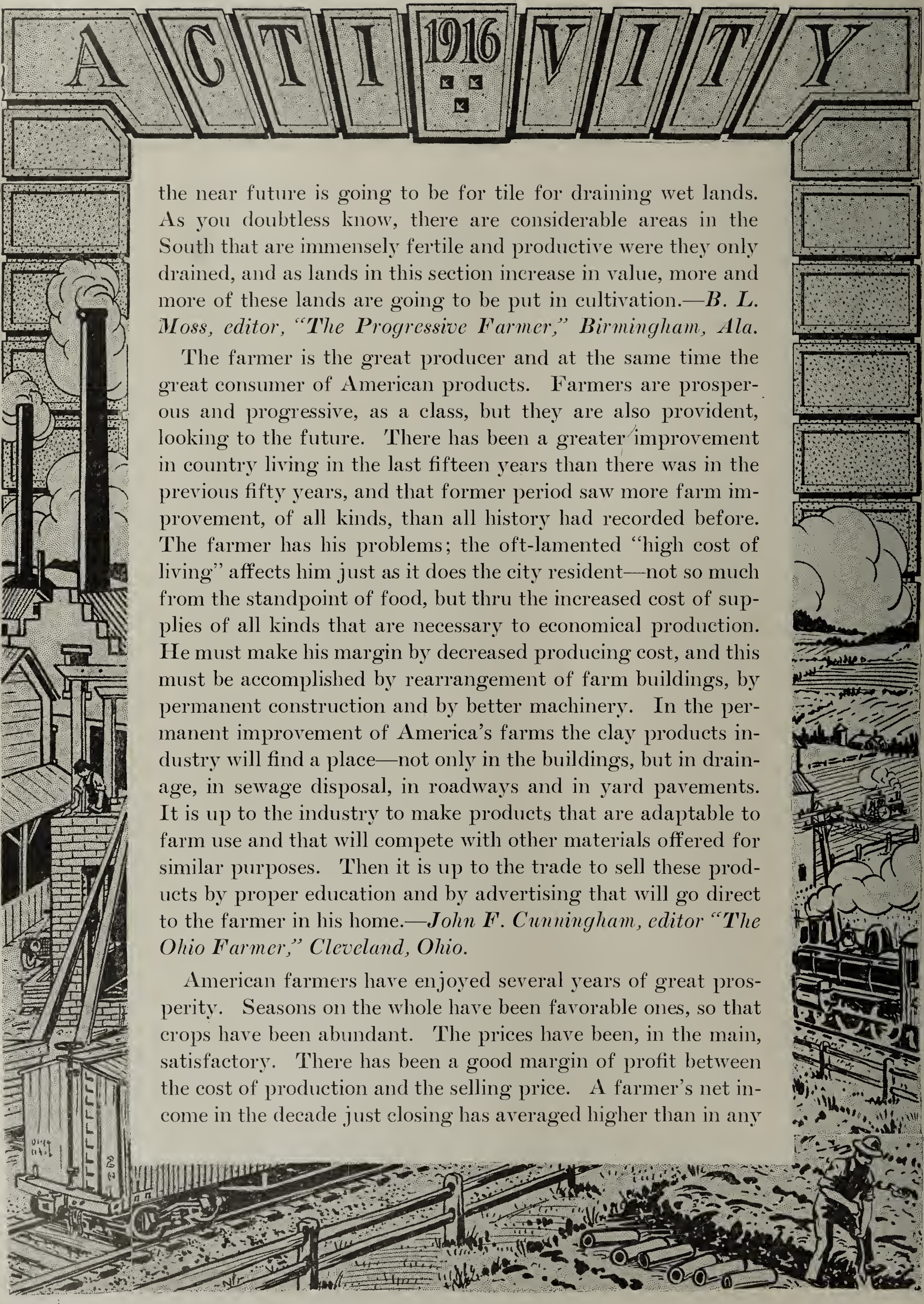
has scarcely begun.—*Alson Secor, editor "Successful Farming," Des Moines, Iowa.*

Permanent construction on the farm moves forward about as rapidly as farm finance will permit. Hollow tile has an important place to play in the movement. It finds admirable adaptation to fireproof construction of farm homes and all outbuildings, and is rapidly growing in favor for silos.—*W. R. Goodwin, managing editor "The Breeder's Gazette," Chicago.*

At the present time there is a growing sentiment among farmers for the erection of permanent, sanitary and fireproof farm structures. This leads to the use of such clay products as hollow clay tile for silos, corn-cribs, floor and wall insulation, and small farm buildings such as poultry houses, dairy houses, etc. The development of this use of tile is, as yet, in its infancy. Nineteen Sixteen promises to be a great year for the carrying out of innumerable drainage projects. It is an excellent time for the drain-tile manufacturer to co-operate with nature in forcing this matter on the further attention of the farmer.—*D. A. Wallace, editor "The Farmer," St. Paul, Minn.*

It is evident to us that the use of clay products and cement is every day becoming a bigger factor to every man who erects a building. The use of clay blocks for farm buildings is much more prevalent in Iowa than in Nebraska. This is due to several reasons, but the three most prominent are that the manufacturers of burned clay have not pushed their product in Nebraska as they have in Iowa, that clay suitable for making good block is not so prevalent in Nebraska as in Iowa and elsewhere, while good sand for cement work is easily obtainable in Nebraska; and, finally, that Nebraska is still in a little newer stage of development than is Iowa. The clay products manufacturers haven't advertised their products sufficiently. They should back up the free publicity that will come in the natural course of events thru the farm papers.—*T. F. Sturgis, editor "Twentieth Century Farmer," Omaha, Neb.*

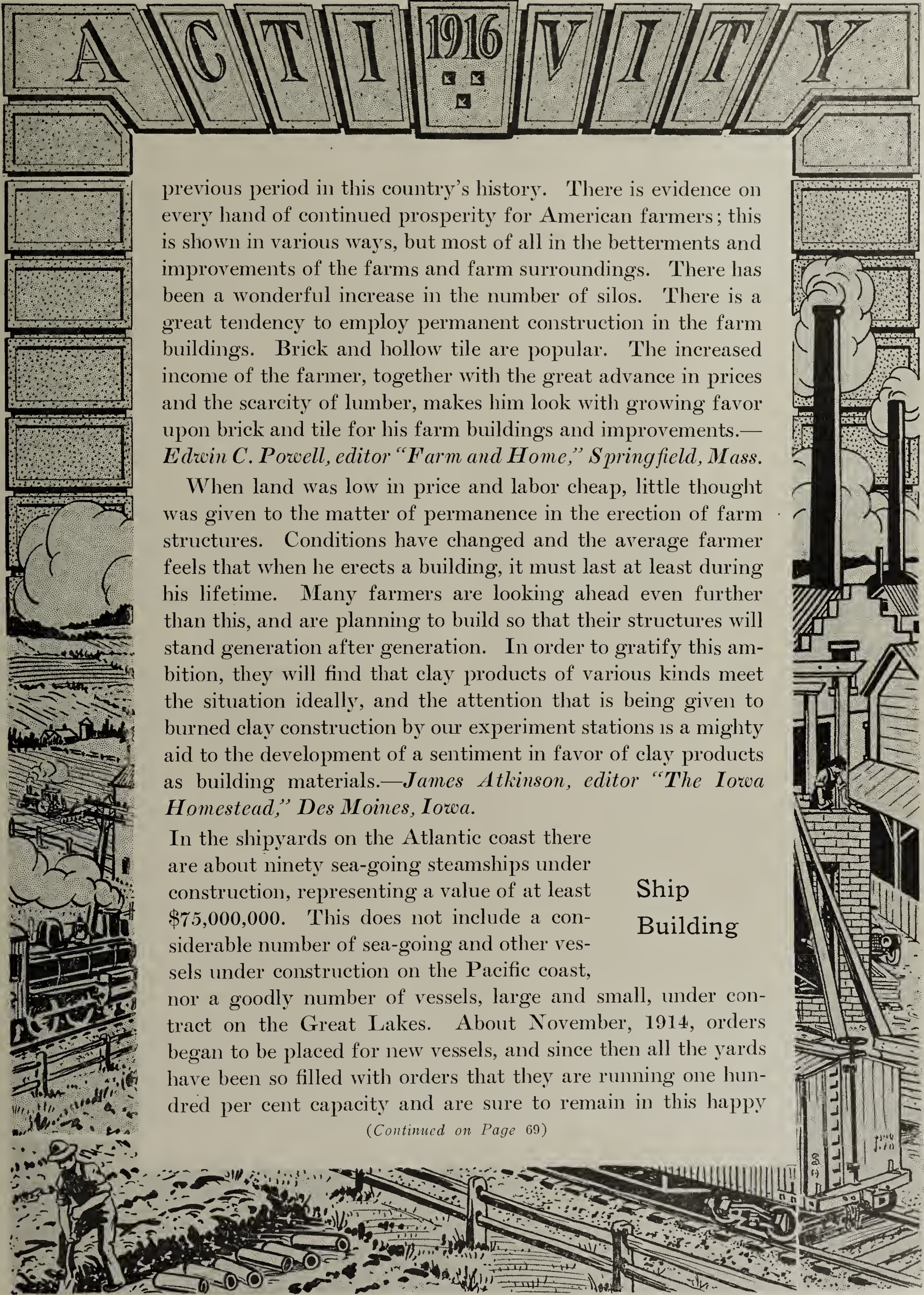
In the South, it is our opinion that the greatest demand in



the near future is going to be for tile for draining wet lands. As you doubtless know, there are considerable areas in the South that are immensely fertile and productive were they only drained, and as lands in this section increase in value, more and more of these lands are going to be put in cultivation.—*B. L. Moss, editor, "The Progressive Farmer," Birmingham, Ala.*

The farmer is the great producer and at the same time the great consumer of American products. Farmers are prosperous and progressive, as a class, but they are also provident, looking to the future. There has been a greater improvement in country living in the last fifteen years than there was in the previous fifty years, and that former period saw more farm improvement, of all kinds, than all history had recorded before. The farmer has his problems; the oft-lamented "high cost of living" affects him just as it does the city resident—not so much from the standpoint of food, but thru the increased cost of supplies of all kinds that are necessary to economical production. He must make his margin by decreased producing cost, and this must be accomplished by rearrangement of farm buildings, by permanent construction and by better machinery. In the permanent improvement of America's farms the clay products industry will find a place—not only in the buildings, but in drainage, in sewage disposal, in roadways and in yard pavements. It is up to the industry to make products that are adaptable to farm use and that will compete with other materials offered for similar purposes. Then it is up to the trade to sell these products by proper education and by advertising that will go direct to the farmer in his home.—*John F. Cunningham, editor "The Ohio Farmer," Cleveland, Ohio.*

American farmers have enjoyed several years of great prosperity. Seasons on the whole have been favorable ones, so that crops have been abundant. The prices have been, in the main, satisfactory. There has been a good margin of profit between the cost of production and the selling price. A farmer's net income in the decade just closing has averaged higher than in any



previous period in this country's history. There is evidence on every hand of continued prosperity for American farmers; this is shown in various ways, but most of all in the betterments and improvements of the farms and farm surroundings. There has been a wonderful increase in the number of silos. There is a great tendency to employ permanent construction in the farm buildings. Brick and hollow tile are popular. The increased income of the farmer, together with the great advance in prices and the scarcity of lumber, makes him look with growing favor upon brick and tile for his farm buildings and improvements.—*Edwin C. Powell, editor "Farm and Home," Springfield, Mass.*

When land was low in price and labor cheap, little thought was given to the matter of permanence in the erection of farm structures. Conditions have changed and the average farmer feels that when he erects a building, it must last at least during his lifetime. Many farmers are looking ahead even further than this, and are planning to build so that their structures will stand generation after generation. In order to gratify this ambition, they will find that clay products of various kinds meet the situation ideally, and the attention that is being given to burned clay construction by our experiment stations is a mighty aid to the development of a sentiment in favor of clay products as building materials.—*James Atkinson, editor "The Iowa Homestead," Des Moines, Iowa.*

Ship Building

In the shipyards on the Atlantic coast there are about ninety sea-going steamships under construction, representing a value of at least $75,000,000. This does not include a considerable number of sea-going and other vessels under construction on the Pacific coast, nor a goodly number of vessels, large and small, under contract on the Great Lakes. About November, 1914, orders began to be placed for new vessels, and since then all the yards have been so filled with orders that they are running one hundred per cent capacity and are sure to remain in this happy

(Continued on Page 69)

The Open Season for Conventions

New Jersey Clayworkers and Ohio Face Brick Makers Elect Officers—Canada Extends a Warm Welcome and Illinois Rakes the State for Untamed Delegates

THE SECOND annual meeting of the New Jersey Clay Workers' Association drew together an enthusiastic representation of Jersey's manifold clay activities. It was held at Rutgers College, New Brunswick, N. J., Wednesday, December 22, and the day following. An excellent program was provided.

The newly elected officers were: Charles Weelans, Monument Pottery, Trenton, N. J., president; Howard Valentine, of R. N. and H. Valentine, Woodbridge, N. J., vice-president, and Cullen W. Parmelee, Rutgers College, New Brunswick, N. J., secretary-treasurer. Members of the executive committee: H. C. Mehrhoff, Little Ferry, N. J., D. H. Applegate, Red Bank, N. J., William Bedson, Trenton, N. J., Douglas Fisher, Sayreville, N. J., John H. Leisen, Woodbridge, N. J., August Staudt, Perth Amboy.

C. A. Bloomfield, retiring president, was unanimously elected an honorary member of the executive committee.

The report on the study of the New Jersey clays was on the progress made in collecting and examining clays from the vicinity of Woodbridge, N. J. One hundred and twenty-five clays were exhibited in the form of trial pieces, each clay having been burned at several different temperatures. The exhibition aroused a great deal of interest among the clay miners and manufacturers present and a resolution was passed, endorsing the work being done and urging its continuance, so that all other deposits in the state may also be examined.

Statistics of the New Jersey clay industries were given by Dr. Henry B. Kummel, state geologist, in the absence of Dr. W. W. Twitchell, according to the data obtained by the Federal and State Geological Surveys.

Howard W. Bloomfield of Metuchen, N. J., gave an excellent paper on the fuel consumption in the burning of fire-proofing which contained valuable information regarding the manufacture of this class of ware.

A paper was read by R. T. Stull, formerly of the Illinois University, and now connected with the Dunn Wire-Cut Lug Brick Company. His subject was "Laminations in Clay Columns."

Samuel Sharkey, in telling of the construction of dies for dry-pressed wares, gave some of his experiences tried out in Trenton, of using porcelain dies for pottery instead of the steel methods now employed. Mr. Sharkey reported that, due to some difficulties, the experiments were not entirely completed, but further trials would be made which, when perfected, will prove that the porcelain dies will be far less expensive to the potter.

Professor Cullen W. Parmelee, of the Rutgers College ceramics department, in discussing the effect of certain fluxes upon terra-cotta clay, gave the results of experiments carried on at the college laboratory the last year. The fluxes used were felspar, glass, whiting, cryolite, thurspar and manganese. All these experiments are stepping stones to further experiments which will have a great effect upon the manufacture of terra-cotta articles.

In the absence of H. H. Plusch, of Perth Amboy, Professor Parmelee read his paper on the subject of building mortar and fire mortar.

Professor C. W. Parmelee and Geo. A. Williams, of Rutgers College, ceramics department, described in considerable detail the results obtained in experimenting with glazes suited for use on sanitary ware.

F. A. Whitaker, of the German-American Stoneware Works, at Keasby, gave a very interesting description of the education of clayworkers at the Royal School of Ceramics in Bunzlan, Germany, and Professor Parmelee read a paper on "The Use of Stain in Bodies."

The paper by Geo. H. Brown, of the Clay Products Laboratory, United States Bureau of Standards, Pittsburgh, Pa., was a valuable discussion of the types of clays best suited for use in the making of saggers.

On Tuesday evening a very delightful informal dinner was held by the association, which was attended by a large number of the members.

Canadian Clayworkers Extend Cordial Welcome to Fellow Workers in the U. S. A.

Brick manufacturers and other workers-in-clay who have been robbed of their annual trip abroad by the activities of the submarines, may have an opportunity of passing customs and putting foot on foreign soil without the hazard of an ocean voyage.

A warm welcome awaits them in Toronto, where, on the 18th, 19th and 20th of this month, the Canadian National Clay Products Association will hold its annual convention. "A prophet is not without honor," we are told, "save in his own country." Go to Canada and taste the good cheer that our friends across the border have awaiting you.

No passport will be necessary. Tell the gentleman in khaki that you are going to the convention. He will understand that your intentions are friendly, whether you be "pro" one side or the other.

Headquarters will be at the King Edward Hotel. Big doings will be held both there and at the Prince George. Good papers will be read and helpful discussions will follow. You can afford to go—you cannot afford to miss it.

Ohio Face-Brick Association Elects Officers

F. A. Hoiles, of Alliance, was elected president of the Ohio Face Brick Manufacturers' Association at the annual meeting held in Columbus, December 15. George J. Markley was elected vice-president, L. G. Kilbourne, treasurer and Carl C. Walters, secretary.

The principal topic of discussion was the Complete Building Show, to be held next month in Cleveland, and a motion was passed that $5,000 be raised for the purpose of building a proper display and for the publication of a book of plans for small brick residences.

Of the amount named, $1,500 is to be spent upon the display and the balance is to cover the cost of the printed matter that will be distributed. Half of the $5,000 was raised at the meeting and the balance is to be raised by a committee consisting of Melville McC. Everhard, Paul B. Belden and George J. Markley.

The proposed book of plans is to be very complete.

covering detailed specifications and drawing of probably ten types of inexpensive brick houses, the object being to provide designs for homes that will cost in the neighborhood of $3,500. The specifications will be so drawn that these booklets can be submitted to contractors in all parts of the country.

A special meeting of the association will be held at the Hotel Statler, in Cleveland, on Wednesday, January 12.

Illinois Clayworkers Plan Big Meeting

While it is a little early to give any very complete idea of the good things in store for those who attend the annual convention of the Illinois Clay Manufacturers' Association, to be held at Peoria, Ill., February 8, 9 and 10, it is well to note that the first evening will be given over to the Peoria reception committee, which has agreed to make the occasion one long to be remembered. On this evening will be held the annual banquet, at which F. C. Schwedtman, of the National City Bank of New York will be one of the guests of honor.

The meetings will be marked by the prominence of the speakers and by the timeliness of the topics that will be discussed. Coal Measures, Shales, Cost Accounting, and the Marketing of Clay Products will be taken up, as will also the matter of Freight, Plant Efficiency, New Methods of Manufacture and General Welfare.

A determined effort is being made to induce many Illinois clayworkers who have never before attended a state convention, to come to these meetings, and give, as well as receive advice and help from those who are working in the same line of industry and within the borders of the same state.

More Than Two Hundred Exhibitors at the Complete Building Show

Exhibits in the "First American Complete Building Show" in Cleveland, February 16 to 26 will total more than two hundred, according to advice contained in a letter received during the past week from General Secretary Ralph P. Stoddard. This is in addition to the seven big community displays, in each of which from four to twenty manufacturers and dealers are combining to show their products.

"As our plans near completion, we are convinced that our show is going to be successful—away beyond our expectations," writes Stoddard.

"From arrangements already made, we will have a delegate attendance of between 5,000 and 7,500 persons, who will meet in Cleveland during the show to participate in trade conventions. These will represent clay products, lumber, hardware, paints, builders' supplies and electrical appliances. These, with the attendance expected to be drawn by the giving away of the complete house, the art display and architectural competition, will, it is estimated, swell the total attendance for the ten days of the show to at least 200,000."

Instead of the usual endless array of individual exhibits of brick, tile, cement and lumber these interests have already arranged to join hands in community exhibits of their various products. The lumber dealers, for example, will build several miniature houses of various woods; the tilemakers will have sections of exterior walls, floors, partitions, etc.; the face-brick and paving-brick manufacturers will show house, lawn and garden structures; common-brick will have a Dutch cottage kitchen, with monster fire-place; the cement makers will have block, brick and molded materials.

Many new products will be on display for the first time at the Complete Building Show. Among these will be self-facing hollow building tile, new shades and styles of brick, large unit brick which produce hollow walls, cement ornaments, fireproofing systems employing expanded metal, gypsum and other retardents, in addition to a great number of newly patented safety and labor-saving devices for the home and the commercial building.

The art section will include a number of painters and sculptors at work, and, in addition, a model of the prize-winning house, together with a full size plan of its first story arrangement.

An adjunct to the art section will be a number of bronzes from one of the country's most famous firms of coppersmiths.

Holiday Greetings!

"Brick and Clay Record" has to acknowledge, with heartfelt thanks, the many holiday greetings it has received from its readers. Every year brings its harvest of cheering sentiment, holly-sprinkled and full of the milk-of-human-kindness.

Among those that have come to the editor's desk were cards and Christmas letters from Sheldon Brick and Supply Company, of Champaign, Ill., the Los Angeles Pressed Brick Company, of Los Angeles, Cal., Smith, Emery and Company, of San Francisco, Cal., M. E. Gregory, of Corning, N. Y., Fallston Fire Clay Company, of Pittsburgh, Pa., Diamond Brick Company, of San Francisco, Cal., Hocking Valley Products Company, of Columbus, Ohio, A. F. Greaves-Walker, of Toronto, Can., Stockton Fire and Enamel Brick Company, Stockton, Cal., Yankee Hill Brick Manufacturing Company, of Lincoln, Neb., Claycraft Brick Company, of Columbus, Ohio, Gardner Read, of Chicago, Belleville Brick and Tile Company, of Belleville, Ill., and the Maruzen Company, Ltd., of Tokyo, Japan.

Coming Conventions

Jan. 14 and 15........Western Paving Brick Mfrs. Assn., Dwight Bldg., Kansas City, Mo.

Jan. 18, 19, 20........Canadian National Clay Products Association........King Edward Hotel, Toronto, Ont., Canada.

Jan. 25........Hollow Building Tile Mfrs. Assn. of America ....New York, N. Y.

Jan. 27 and 28........Wisconsin Clay Manufacturers' Association........Milwaukee, Wis.

Feb. 3 and 4........Iowa State Clay Products Mfrs. Association........Iowa State College, Ames, Iowa.

Feb. 8, 9, 10........Illinois Clay Products Association........ Hotel Jefferson, Peoria, Ill.

Feb. 8, 9, 10........Chamber of Commerce of the United States of America, Washington, D. C.

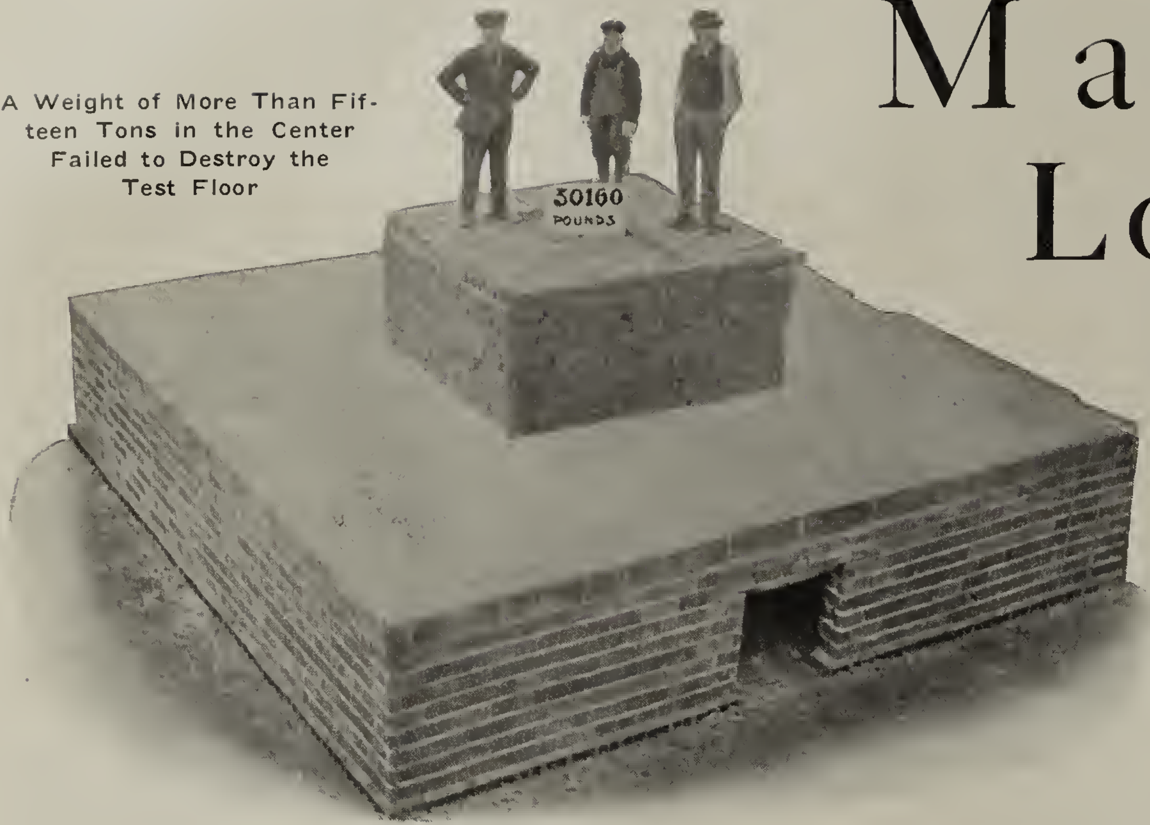
Feb. 17, 18, 19..........National Builders' Supply Association..................Hotel Statler, Cleveland, Ohio.

Feb. 21 to 24........American Ceramic Society, Cleveland, Ohio.

Feb. 21 to 26........National Brick Manufacturers' Association........Hotel Statler, Cleveland, Ohio.

Feb. 22 to 25........American Road Builders' Assn................ Pittsburgh, Pa.

Feb. 16 to 26........THE COMPLETE BUILDING SHOW ....The Coliseum, Cleveland, Ohio.



A Weight of More Than Fifteen Tons in the Center Failed to Destroy the Test Floor

Making Low Cost Fireproof Homes a Reality

REAL fireproof residence construction, with floors and ceilings of burned clay, and at a cost that is practically the same as wood, is being made possible by the work of the ***Permanent Buildings Society of Iowa.*** *The organization, made up almost entirely of hollow-tile manufacturers with Iowa plants, is financing the experiments that are being conducted by* ***M. L. King****, and which are herein described.*

RESIDENCE FLOORS—absolutely fireproof—at little more than the cost of a good wooden floor, are foreshadowed as the result of experiments now being conducted by Matt L. King, secretary of the Permanent Buildings Society, Des Moines, Ia.

It has long been considered impractical to build fireproof floors in residences, of moderate cost, the "luxury" of fire safeness being reserved for the wealthy house-owner. That a fireproof floor in a home is desirable, is hardly to be questioned. Time and time again, attention has been called to the folly of building the exterior walls of a residence of brick or hollow-tile while the interior work—floors, partitions, stairs and casings—is constructed of highly inflammable materials. Instances without number have been pointed out where a fire, starting on the inside of a house (as it usually does) has gutted the interior and left only the charred walls standing—the remains of what was considered to be a "fireproof" home.

Late in November, at the plant of the Adel (Ia.) Clay Products Company, about twenty-two miles northwest of Des Moines, a test floor was built, as shown in the accompanying illustrations. The foundation of a small cottage was first erected of hollow-tile and carried to the floor level. The foundation was twenty feet square, 5 x 8 x 12 inch tile being used in its construction.

A temporary floor of wood was then built, and upon this the hollow-tile floor. In constructing this floor the tile were laid up in somewhat the same manner as they are in a wall, the only difference being that the slab is horizontal instead of vertical. A disc or circle was built, and, unlike most fireproof floors, no reinforcing was used, the circle being tied together by several bands of plow steel one-eighth inch thick by two inches wide.

It can be readily seen that a circular floor, laid upon a square foundation, would leave four corners in which there was no floor at all. These corners were filled with hollow-tile, mortared together and squared off with the edges of the foundation. The floor then became square in shape. Bands of plow steel were then wound around its perimeter to tie in the corners. On top of the tile floor a thin coat of cement was spread, giving it the finished appearance shown in the illustration at the head of this article.

After sufficient time had been allowed for the mortar in the floor to thoroly dry, Prof. R. W. Crum, of the engineering experiment station, Iowa State College, Ames, together with Mr. King and other interested parties, pro-

A Close-up View, Showing the Steel Reinforcing Which Was Used Both Around the Circular Section and the Entire Perimeter of the Floor ceeded to test the hollow-tile floor for its load-bearing ability.

The first step taken in this test was the removal of the supports from under the floor, the result being practically no deflection. A load of 20,000 pounds of paving-brick was then placed in the center of the floor, a slight depression resulting. The load was increased to about 31,000 pounds—30,160 to be correct—resulting in considerable deflection, but not the destruction of the floor. This load is still being supported more than a month after having been placed upon the floor, and will remain until about the middle of the present month, when it will probably be removed to determine whether or not the floor will "come back"— that is, whether or not it will resume its original level when the load is lifted.

Then more brick will be piled upon the floor, which will be loaded to destruction, a careful study of its behavior being made under the direction of the Iowa State engineering experiment station. At the first test Prof. Crum made some careful observations of the effect of the stress and strain on the reinforcing steel.

The floor was built to carry a load of 100 lbs. to the square foot—a strength far greater than needed in any residence—but is at present supporting approximately 30,000 lbs. on sixty-four square feet in the center—about 470 lbs. per square foot.

The significance of these tests is very plain. If successful, they will enable the manufacturer of clay products to sell materials for a home that will be fireproof, not merely in word, but in deed, and at a cost that can be truthfully said to be "little more than frame."

Mr. King states that in a square building the circular type of floor, the same as was used in the above described tests, can be employed, while where a rectangular building that has a much greater measurement one way than the other, should employ a construction that is elliptical.

However, the method of construction used in building this test floor was not the most economical possible, and further study of this problem will have for its purpose the fashioning of a tile or block that will entirely eliminate the mason and his trowel in this the laying of these floors, thereby effecting a considerable saving in cost.

Erecting the Falsework on Which the Floor Was Laid. These Supports Were Removed Before the Tests Were Made

Just how this will be done is not certain, but the idea being developed is the laying of blocks like paving-brick and then grouting them to form a bond. It can readily be seen that this would be a speedy and inexpensive method of laying these floors.

Mr. King is working with ideas that are firmly founded on sound engineering principles. Advising with him and deeply interested in his work are some of the best known housing experts in America.

Rough Faced Hollow Tile Becoming Popular

Rough-surfaced hollow-tile, as a substitute for both face and common-brick may be given its first presentation to northern Ohio during the coming month, according to A. O. Pryor, manager of the building supply departments of the Goff-Kirby Coal Company, of Cleveland. Mr. Pryor claims to have had considerable success in New York and Boston, using the new tile for residence construction. The new product is 5x8 inch and is in colors ranging from light yellow to bronze. "This article has made a hit wherever it has been shown," says Mr. Pryor, "and we expect even greater success in this district. The fact that these tile can be used either in one color or with a combination of colors, and with contrasting mortar joints, according to the architect's judgment, makes them especially attractive to home-builders."

Lumber Men Adopt Brick and Hollow Tile

Like a range of silos loom out of the fast thinning forest the sawdust and rubbish consumers of the modern sawmills. Usually these structures are of brick or iron-clad tile. They have stood the test of time, usage and climate. The lumbermen seem to know more about burned clay than makers and sellers of clay products are able to impress upon prospective home-builders. Dry-kilns, sawdust consumers—sometimes the entire equipment of a lumber manufacturing concern—will be of brick or hollow tile. Seldom indeed is cement used and then only in the form of cement block—never poured concrete.

About the agricultural sections of the forest one meets here and there a wooden or iron silo—most of them abandoned and ruined. Yet the farms are not deserted: the farmers claim that so much silage has been spoiled in those inadequate containers—owing to its excess moisture and swampiness—that their use is *nil.* Yet these sections are in dire need of serviceable silos and a little experimental missionary work on the part of silo block manufacturers should bring home a sure profit.

New England Hears of Hawkeye Clayworkers

A New England subscriber writes that he has recently had an opportunity of talking to a Boston man who had just returned from Iowa. The Boston man said:

"The Iowa drain-tile manufacturers ought to have a monument, sometime, erected to commemorate the revolution they have made in the value of the Iowa farm-land. Farms which, up to a few years ago, could be bought for sixty to ninety dollars an acre have, by the skilled use of burned clay tile, been made so productive and valuable that some of them are bringing from $250 to $350 an acre. I have been buying tile for thirty years, and slapping them into my farms. I find the money I spend that way is a better investment than any other I ever made—except, possibly, the buying of the farm-land in the first place."

Refractories Impossible in Iowa Clays

Bulletin No. 40 of the Engineering Experiment Station, Iowa State College, Ames, Ia., declares that it is impossible to attain commercial success in the production of refractories from Iowa clays. A copy of the bulletin may be had by writing to the Director of the Engineering Experiment Station, at the address above named.

Rigid Tests for Fire Brick and Fire Clay

Testing the Brick Before It Is Shipped Is Better Than Having it Fall Down in Use. Why Not Test Your Own Material?

EDITOR'S NOTE: This article was published in the "Iron Trade Review" and is written from the standpoint of the ultimate consumer. Since the manufacturer of the fire-brick is blamed, more often than not, for faults that are not altogether his, it might be well if tests of this kind were made on the brick at the plant where it is produced. That would prevent its being offered for uses to which it was not fitted and, incidentally, give the man who makes the right kind of brick enough confidence in his product to make him willing to stand out for a price.

By J. F. Mowat

Steam Engineer of the Joliet (Ill.) Plant of the Illinois Steel Co.

IN THE STEEL TRADE and allied industries, the use of fire-brick and fire-clay is so general that this material must be considered an important factor in the cost of operation. Consequently, the quality of these products has a real bearing on profits. Blast furnaces must be lined and relined, heating furnaces, open-hearth furnaces and coke-ovens must be built, repaired and rebuilt. Repair work is not only expensive, but at times causes delays which involve a serious loss of money.

It is a surprising fact that up to a few years ago little attention was given to the choice of refractory materials. Personal prejudice or low cost, as a rule, determined what brand or make should be used. As a result, most companies had no real idea as to the merits of the materials they were using and so carried out expensive involuntary experiments in their blast furnace linings and in their furnaces.

PRELIMINARY TESTS

In recent years the manufacturers have begun to awaken to the fact that it is cheaper to know what they are going to use, rather than to trust to luck that the brick or clay will be satisfactory and not in the long run prove highly expensive. This has led to a common-sense view of the situation that is causing a demand for preliminary tests to prove the worth of these materials before they are accepted.

These tests may be made in a comparatively short time, and when conducted on representative samples give a reliable indication of the behavior of the materials in service. They may be rather elaborate, consisting of physical tests, chemical analyses and heat tests. I will consider first the testing of brick and then that of clay.

PHYSICAL TESTS OF BRICK

The physical tests include the determination of the crushing strength, the specific gravity and the resistance to abrasion. These tests are of minor importance compared with the heat tests, tho they are desirable when complete data are desired. It is not essential to find the crushing strength, for almost always it will show a considerable factor of safety. I do not remember a case, of the large number of tests that I have made, when the crushing strength was not far greater than necessary to carry the maximum load to be applied.

The determination of specific gravity is of interest principally from the fact that it shows the density of the brick. This has an influence on its power of resisting abrasion. Brick of greater density have this power in a higher degree, generally, than those of the same composition, but of lesser density. Specific gravity is found by weighing the brick dry, then immersing it in a vessel filled with hot water and allowing it to remain until the air has been expelled and the absorption of water has ceased. Tho a shorter time is sufficient, it is advisable to leave it in the water from eighteen to twenty-four hours. At the end of this time the brick should be weighed while suspended in water and then removed, wiped dry and weighed again. Calling the weight dry A, the wet B and the weight in water C, we have the following formula:

True specific gravity.................. $= \frac{A}{A-C}$

Apparent specific gravity.................. $= \frac{A}{B-C}$

Porosity, per cent of voids.................. $= \frac{B-A}{B-C}$

Absorption, per cent by weight.................. $= \frac{C-A}{A}$

THE TRUE SPECIFIC GRAVITY

The true specific gravity is the ratio of the weight of the brick to the weight of a volume of water equal to the volume that the brick would have, if it were compressed into a non-porous mass. The apparent specific gravity, which is the figure on which density is based, is the ratio of the weight of the brick to a volume of water equal to the apparent volume of the brick, that is, the volume displaced were the brick without voids. The porosity is the per cent of voids in this total volume, while the absorption is the ratio of water, by weight, taken up, to the weight of the dry brick. The weights should be measured on a balance and should be, if possible, for the whole brick. However, if a large balance is not available, the determinations may be made on a fragment of brick with sufficiently accurate results.

MEASURING ABRASION

Abrasion, in the case of fire-brick, occurs principally in the linings of blast furnaces and of coke ovens. There are several arbitrary methods of measuring it, but the one I found most convenient was to weigh the brick and then hold it, with a uniform pressure, to the side of an emery wheel revolving at constant speed. Having determined the specific gravity, it was possible to find the cubic inches of brick removed per square inch of surface exposed from the loss in weight. The results obtained, of course, are only comparative, but as such are of value in choosing a brick capable of resisting wear. The apparatus is simple, consisting of a carriage to hold the brick, running on practically frictionless rollers and held against the emery wheel by a bell crank with a weight attached. As the movement is small, the pressure exerted on the carriage is practically constant. The illustration (Figure 1) shows this arrangement.

HEAT TESTS

Far more important than the abrasion tests, except in the case of brick exposed to continual wear, are the heat tests. In these it is desirable, first, to ascertain whether the bricks will soften or melt when exposed to the temperature at which they are to be used; second, to learn how much they will expand or contract when hot, and third, to determine whether there is a change in size which continues after they are cooled to their original temperature.

TABLE I.
Analyses of Good Brick and Clay. Per Cent by Weight

	SiO_2 Per cent	$A1_2O_3$ Per cent	Fe_2O_3 Per cent	CaO Per cent	MgO Per cent	Na_2O and K_2O Per cent	Loss on Ignition Per cent
Silica Brick....	94.00	2.50	1.00	2.00	0.20	0.20	0.10
Clay Brick......	54.50	40.00	3.00	0.30	0.50	1.60	0.10
Plastic Brick..	55.00	30.00	2.00	0.20	0.70	2.10	10.00

The analysis is valuable in furnishing an indication of the probable resistance to heat. It should be made on a sample taken from the heart of the brick, to avoid surface impurities and should show silica, SiO_2; alumina, Al_2O_3; ferric oxide, Fe_2O_3; lime, Cao; magnesia, MgO, and the alkalis, sodium and potassium oxides, Na_2O and K_2O. Of these constituents, the iron oxide, lime and alkalis have an effect on the refractory qualities. Lime and the alkalis generally occur in small enough quantities to have, in themselves, no bad effect. Iron oxide, on the other hand, occurs as a rule in larger quantities and as it is an excellent flux for silica in the presence of the other fluxes, should be looked on with suspicion. As a rule, more than 4 per cent of ferric oxide causes danger of softening. When it reaches 5 per cent, with from 2 to 3 per cent of alkalis and 0.5 per cent of lime, the brick is almost certain to become plastic at less than 3,000 degrees Fahr.

TABLE II.
Sieve Test of Properly Ground Clay

Per cent by weight on	Per cent
10 mesh sieve	0.00
20 mesh sieve	14.00
40 mesh sieve	26.00
60 mesh sieve	23.00
80 mesh sieve	1.00
100 mesh sieve	5.00
200 mesh sieve	16.00
Thru 200 mesh sieve	15.00

The expansion when hot is of more importance with silica than with clay brick, as the former always expand approximately ¼ inch to the foot when heated to 2,900-3,000 degrees Fahr., while the latter generally expand from 0.05 to 0.1 inch to the foot at the same temperature. It is evident that with a brick that increases perceptibly in size, it is advisable to provide expansion joints. A measure of the expansion determines the size of these joints.

The permanent change in size is an indication of the temperature at which the bricks were burned in the kilns. Clay brick shrinks when burned, while silica brick expands. Consequently, if you heat a clay brick and find that when cool it is smaller, or with a silica brick, that it is larger, you may be confident that the temperature in the furnace was higher than that in the kiln where it was burned.

HEAT TESTS OF BRICK

In order to conduct the tests, it is necessary to have a suitable furnace for heating the samples. Experience with several types leads me to prefer the one shown in Fig. 2. This is a horizontal, cylindrical furnace, closed on the ends by counterweighted brick doors, and provided with supports to hold the sample bricks up so that the flame can pass around them. The fuel may be either crude oil or illuminating, coke-oven or natural gas. Gas makes the better fuel, owing to the ease in handling it, its rapid combustion and freedom from trouble during cold weather. The fuel should be forced in with compressed air, to get rapid combustion and an intense local heat. I have obtained the best results with the burner shown in Fig. 4. The flame from the six burners, which are about thirteen inches apart, enters tangentially at the top of the furnace and, traveling with considerable force, is whirled around the cylinder two or three times before it finds the flues which are located on the same side as the burners and are likewise tangent to the cylinder. The escaping gases preheat the air supply for the burners. The arrangement of the furnace and burners insures a thoro mixture of the gas and air, allows ample time for combustion to take place and distributes the heat uniformly, so that an even temperature may be maintained. Using coke oven gas for fuel, I have produced a maximum temperature of 3,200 degrees Fahr. in this furnace and, as a rule, have had little trouble in reaching between 2,900 and 3,000 degrees Fahr.

Following are directions for conducting a test with the furnace: Select the sample, choosing brick that are representative of the whole lot. A good way is to shut your eyes and pick here and there from the pile. This does away with the personal factor.

Nine-inch brick are most convenient to use, but other sizes may readily be tested. Take enough to make a total length of about three feet when laid end to end. To determine the permanent change in size, measure the length of each brick on both sides and in the middle and make a record of its position and number for identification of the dimensions.

The next thing to do is to prepare to measure the expansion of the brick when hot. To do this we have used water-cooled calipers, as shown in Fig. 3. When water is running through the pipes, they may be inserted in the hot furnace without error due to expansion. With a sample consisting of four nine-inch bricks, laid end to end, the initial length is great enough to reduce the error in observations to a fairly small figure.

Lay the brick out on the shelf in front of the furnace to measure the individual lengths and the total length when laid end to end. Next caliper the samples by placing the jaws across the ends, marking the pipe at the outside end of the sleeve, *A*, Fig. 3, with a lead pencil. Next place the bricks on the supports in the furnace, in the same relative positions, to insure getting the inequalities located so as to give the same total length. Check this length with calipers to make sure that the

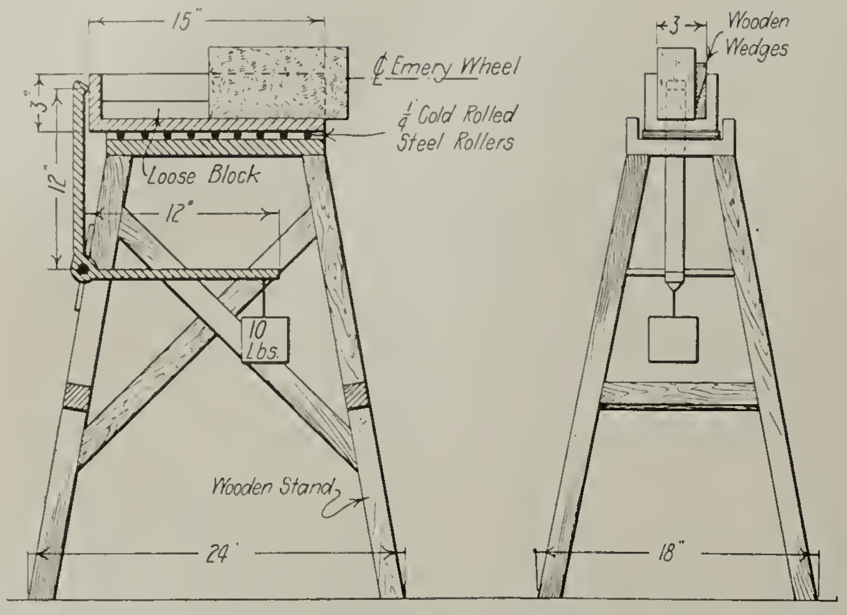


Fig. 1. Apparatus for Abrasion Test with Emery Wheel

pencil mark comes at the right place. The furnace will hold two of these samples.

HEATING THE BRICK

The brick are now ready to heat; light the gas and allow it to burn for a time with an insufficient supply of air. This allows the brick to heat slowly, an advisable proceeding in all cases, but essential with silica brick, as rapid heating produces a much higher temperature on the surface than in the interior and due to their high rate of expansion, causes them to spall and crack. After about an hour, the temperature may be increased gradually, reaching a maximum in from four to six hours. It is advisable to maintain this temperature for at least two hours, in order to allow the brick to become heated thru. The temperature to be attained is to be determined by the probable temperature to which the brick are to be exposed. Thus, for silica brick to be used in coke ovens and open-hearth furnaces, it is well to reach a temperature of 3,000 degrees Fahr. This also applies to the hearth and bosh and inwall brick for blast furnaces. These are the brick that extend from the bottom, or hearth, about two-thirds of the way to the top. In the case of brick for heating furnaces, it is generally sufficient to reach a temperature of 2,700 degrees Fahr., tho checker brick sometimes get hotter than this. The samples should be watched carefully thru the inspection holes, so that if any softening becomes apparent, the temperature may be noted.

We have tried various methods of measuring the temperature, using Seger cones, thermo-couples and optical pyrometers. Seger cones are not adapted to this work and proved unreliable, and were used merely as a rough check on the pyrometer. The trouble with the thermo-couples was that we could find none that would last a reasonable time at the high temperatures reached. The instrument that we finally pinned our faith to was the optical pyrometer. We are able to calibrate this before each test and have always obtained results that compare in accuracy with any other form of pyrometer that we have used.

After the brick have remained in the furnace the proper time, connect the supply hose to the calipers, turn on the water and turn off the gas. Immediately insert the calipers, hold the jaws firmly against the brick and have an assistant mark the pipe at the end of the sleeve. The distance between the two marks shows the actual amount that the bricks have expanded. From this figure and the original length, the expansion per lineal foot at the maximum temperature may be calculated. The result shows whether expansion joints will be required and if so, how large they should be.

After the bricks are cold, remove them from the furnace in order and examine them to see whether there is excessive pitting due to iron oxide and whether they show any signs of softening or fusion. Softening in the test furnace in the short time they are heated means a greater degree of softening in the furnaces where the heat endures for a long time. Consequently, if this is appreciable, the brick should be rejected. Another point of interest is cracking and spalling. If the samples are heated carefully they should neither crack nor spall, so if they space badly, or develop large cracks, they should not be used, as this same condition will undoubtedly occur where they are used.

Next measure the brick at the sides and middle to see whether there is a permanent elongation or contraction. For comparison with other brick this should be calculated per lineal foot. If there is a contraction in the case of the clay brick, or an expansion in the case of the silica brick, the samples have not been burned long enough. It is better to do the burning in the kilns rather than in the furnaces where they are to be used, so this point should be insisted upon.

TESTING FIRE CLAYS

There are several qualities to watch in the case of clays. As with brick, the analysis gives a good indication of the

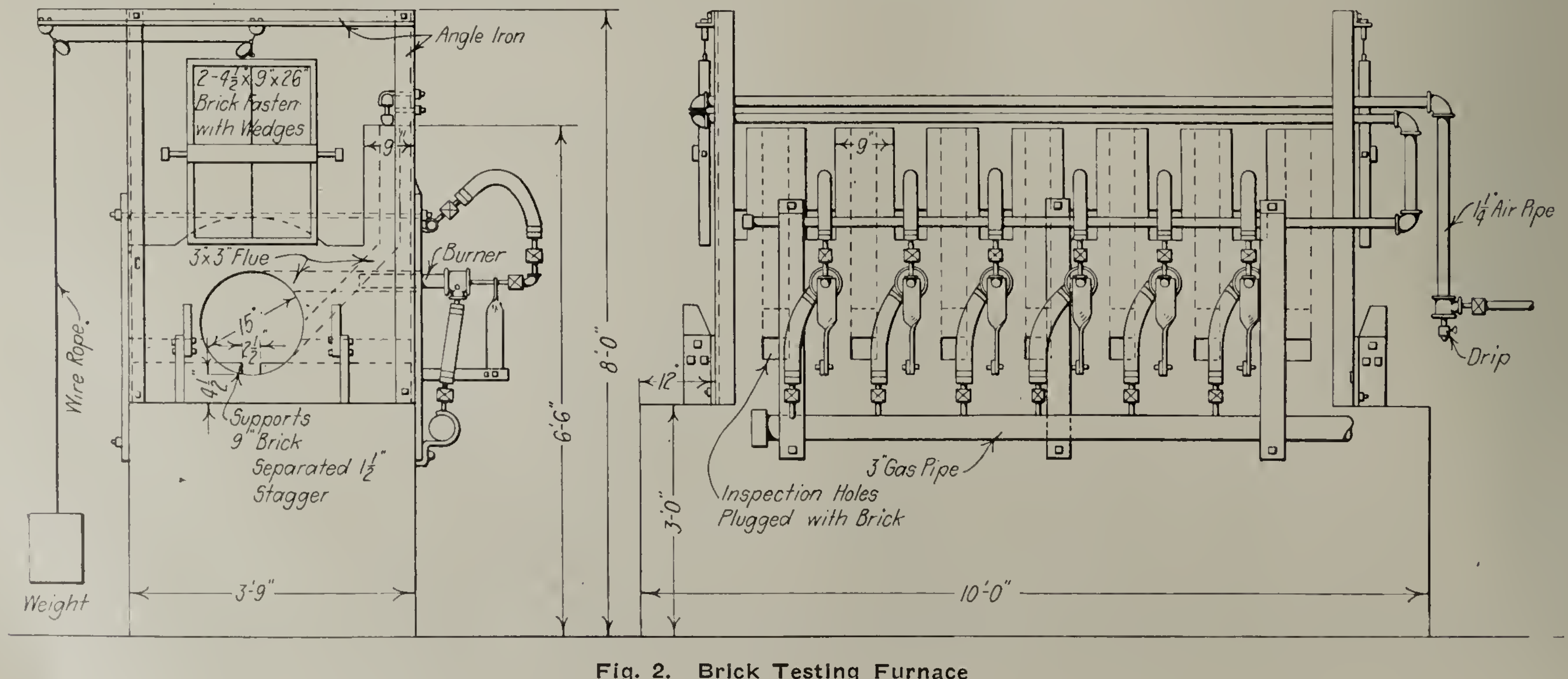

Angle Iron
2-4½"x9"x26" Brick Fasten with Wedges
9"
3"x3" Flue
Burner
15"
2½"
4½"
Supports 9" Brick Separated 1½" Stagger
Wire Rope
Weight
3'-9"
6'-6"
8'-0"
12"
3'-0"
9"
1¼" Air Pipe
Drip
3" Gas Pipe
Inspection Holes Plugged with Brick
10'-0"

Fig. 2. Brick Testing Furnace

refractory power. Here, too, the iron oxide, lime and alkalis should be examined, for in the same way they may produce fluxing. This is not as serious as in the case of brick for a small amount of fusion is a good quality, since the clay possessing it will make a stronger bond than will an inert clay. Excessive fusion, on the other hand, will cause the clay to melt and run out from between the bricks.

The heat tests are to be made in the same furnace as the brick tests and at the same temperatures. The best way to proceed is to mix the clay with water to the plasticity of putty and then mold it into the form of Seger cones. These are pyramids, about 3 inches high, with bases about 5/8 inch on each side. They should be dried and then set upright on clay bases. A row of four cones in a base constitutes a sample. The samples next should be thoroughly dried in a steam oven to drive off all the moisture and then should be heated in the test furnace. The points to watch are excessive fusion or melting and serious pitting due to iron oxide. A little experience will enable one to segregate the good clays from the bad.

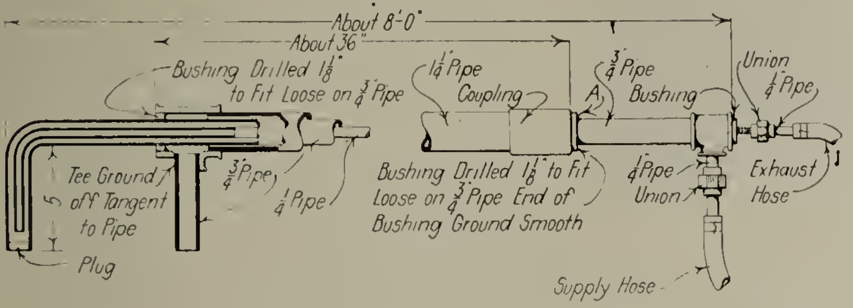

About 8'-0"
About 36"
Bushing Drilled 1 1/8" to Fit Loose on 3/4" Pipe
1 1/4" Pipe
Coupling
3/4" Pipe
A
Bushing
Union
1/4" Pipe
Tee Ground off Tangent to Pipe
5
3/4" Pipe
1/4" Pipe
Bushing Drilled 1 1/8" to Fit Loose on 3/4" Pipe End of Bushing Ground Smooth
1/4" Pipe
Union
Exhaust Hose
Plug
Supply Hose

Fig. 3. Water Cooled Calipers

There are two other points as important as the ability to resist heat. These are fineness and plasticity. All clay used for laying fire-brick should be ground and screened. To make good joints the clay should be made into a *soup*, thin enough to allow very small joints to be made. The brick should be laid close together, preferably about 0.6 inch apart. Consequently, it is evident that the clay should be ground fine. All should pass thru a 10-mesh sieve and the greater part thru a 20-mesh sieve.

Plasticity is of importance in mixing the clay. A sandy clay, when mixed with water, will settle-out very rapidly, so that it will be next to impossible to use it successfully. On the other hand, a plastic clay will remain in suspension a considerable length of time, making a *soup* that will remain mixed until used. A simple test is to put a half inch of clay in a drinking glass, add water and stir. If the clay settles-out rapidly, it will prove hard to use, while if it remains in suspension it will be satisfactory.

In conclusion, I will include, for convenience, the summary of the tests to be made.

TESTS OF FIRE BRICK

Crushing Strength.—This is almost invariably far higher than necessary, so the test may be omitted, unless results from an academic standpoint are desired.

Specific Gravity.—The apparent specific gravity determines the density, which is an indication of the wearing qualities of different brands of brick of approximately the same composition.

Abrasion.—The comparison of the powers of different bricks to resist abrasion is of value when choosing bricks for the top of blast furnace linings and for the linings of coke ovens. Otherwise this feature is not particularly important.

Analysis.—The analysis furnishes a good indication as to what the refractory qualities of the brick will be and explains the results obtained from the heat tests.

Refractory Qualities.—The tests should be made at a temperature ranging from 2,700 to 3,000 degrees Fahr., depending on the use for which the bricks are intended. Either softening or melting, cracking or spalling to a marked extent, or serious pitting due to iron oxide, is enough to warrant rejection.

Expansion When Hot.—This is an indication of the size the brick will attain in service and is of value in designing furnaces.

Permanent Change of Size.—Under-burned brick are unreliable when heated above the kiln temperature and therefore are not desirable. A permanent change in size that continues after the bricks are cold is a proof of such a condition.

TEST OF FIRE CLAYS

Analysis.—As in the case of brick, this gives a reliable indication of the refractory qualities of the clay.

Heat Tests.—Excessive fusion, melting or serious pitting are enough to condemn a clay, where heat resistance is required. On the other hand, incipient fusion is beneficial, as it promotes a good bond.

Fineness.—It is of primary importance to have a clay fine enough to make very thin joints, as these are essential to successful furnace work.

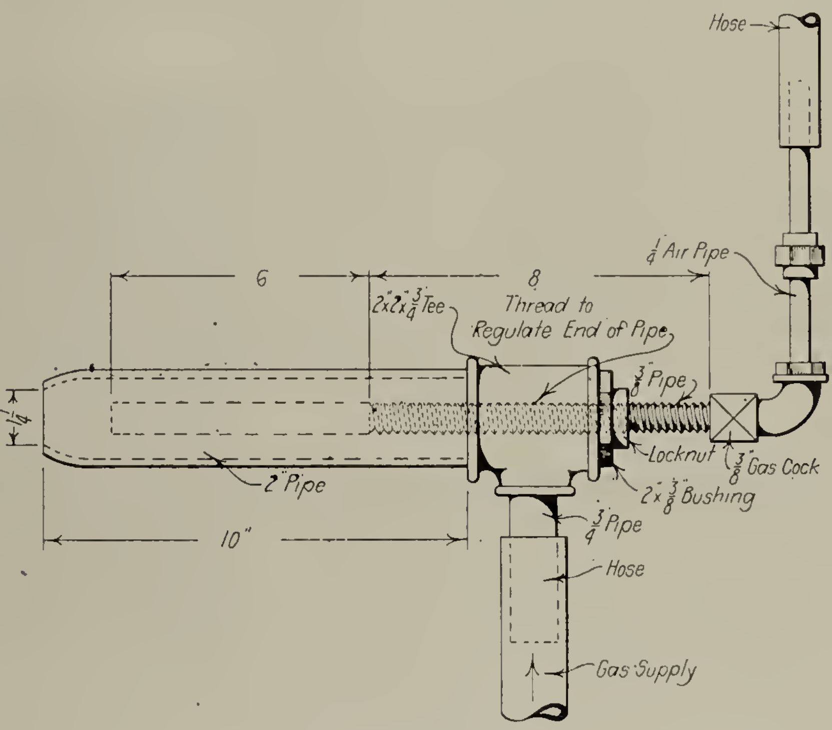


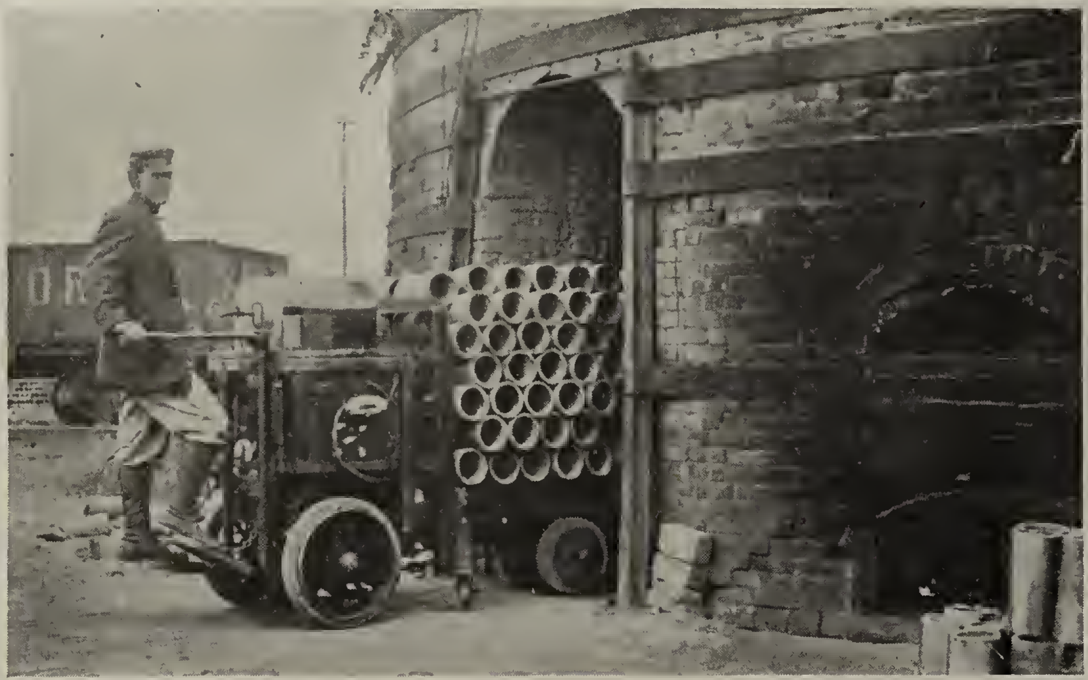
Fig. 4. Gas Burner

Plasticity.—A clay that remains in suspension produces a good mortar. Plasticity is the quality that produces this result, so it should be observed.

As a rule, it is not necessary to make all these tests, unless complete data are desired. For general work, the tests of crushing strength, specific gravity and abrasion may be omitted. It is comparatively simple to make the rest of the tests, and the cost will be small compared with the increased efficiency of the brickwork.

The Next Issue (January 18) Will Contain

the opening chapters of a new serial by A. F. Greaves-Walker, on the proper adjustment of hollow-ware dies. It will be profusely illustrated.



The Electric Transfer Truck With a Load of Drain-tile

Eliminating the "Wheeler"

STANDING at the dividing line between skilled and unskilled labor, the "wheeler" has all of the independence of the first and the inefficiency of the second. He is the prime nuisance of the clayworking plant. Here is told how an Iowa drain-tile manufacturer has reduced him to the vanishing point.

SPEED—and a saving in kiln-emptying costs are the result of a carefully executed idea in plant management that has come to light recently on an Iowa drain-tile and hollow-ware factory.

One of the most expensive and seemingly snail-like processes on the ordinary plant, whether it manufactures brick, hollow building tile or drain-tile, is that of emptying the kilns and loading the finished ware into cars or stacking it in the yard. Wheelbarrows, propelled by "man power" of the most exasperating type, are the usual equipment, and it is needless to say that this combination is far from being economical.

A storage battery transfer truck, with a carrying capacity of two tons, together with a set of steel racks, has effectively solved this problem.

In emptying the kilns, all but the last five courses are removed by a belt conveyor which has an elevating head that will reach nine feet above the ground. In this way the ware is quickly placed outside of the kilns where it is loaded onto the iron racks, some of which may be seen in the accompanying illustrations. These racks are built strong enough to hold seven hundred brick, with a total weight of about thirty-five hundred pounds; two hundred and ten pieces of hollow-tile, weighing approximately three thousand pounds or two hundred pieces of drain tile weighing about a ton. When a rack has been filled with ware the truck, which has a low, flat platform, is run under it, and the platform elevated, lifting the rack up from the ground. This is accomplished in ten seconds by mechanism that is operated by a separate low voltage motor, receiving power from the same battery as the propelling motor. The platform with the loaded rack upon it can be lowered in seven seconds. The truck then speeds away at the rate of about six miles an hour to the inside of the waiting car, the loading platform or to the stock piles, where the rack is set down, the truck picking up an empty rack there and returning to the kiln for another load. When it arrives at the kiln the empty rack, which it is returning, is set down outside and a loaded truck rack lifted up, this operation being repeated again and again.

When the last five courses in the kiln are reached, the conveyor is then dispensed with and the car driven into the kiln. The labor of three men is saved at this point of the process by using the truck and the racks.

The all-steel truck itself is well built, being strong and able to withstand hard usage. It is driven by a special high torque motor, the current for which is supplied from a 24 volt, 225 ampere hours storage battery. The operator stands on two pedals at one end of the truck, facing it, as may be seen in the accompanying illustrations. The control of the machine is so arranged that the power is applied or shut off by a lever at the left hand side of the operator with three speeds in either direction. When he steps off of the right pedal, the brakes on the truck are automatically set, and when he steps off of the left pedal, the connection between the motor and the battery is severed. Thus, if the operator should happen to fall, or be knocked off of the truck, it would stop within five feet, altho it might be traveling at full speed. The steering apparatus is operated by a long lever (which has a push button in the end of the handle for operating warning bell) in the right hand of the driver, and is so arranged, that both the front and the back pairs of wheels may be turned simultaneously, one pair to the right and the other to the left. The truck can be turned in a radius of seven feet. Its battery capacity is sufficient for a day's work. With 110 volt direct current, it costs approximately thirty cents per battery charge.

Solid rubber tires on the wheels of the truck prevent its slipping in anything but the softest mud. The tires also make its operation noiseless, minimizing the jar received by the load in transportation, thus effecting a considerable saving in cracked and damaged ware over the old method of wheeling.

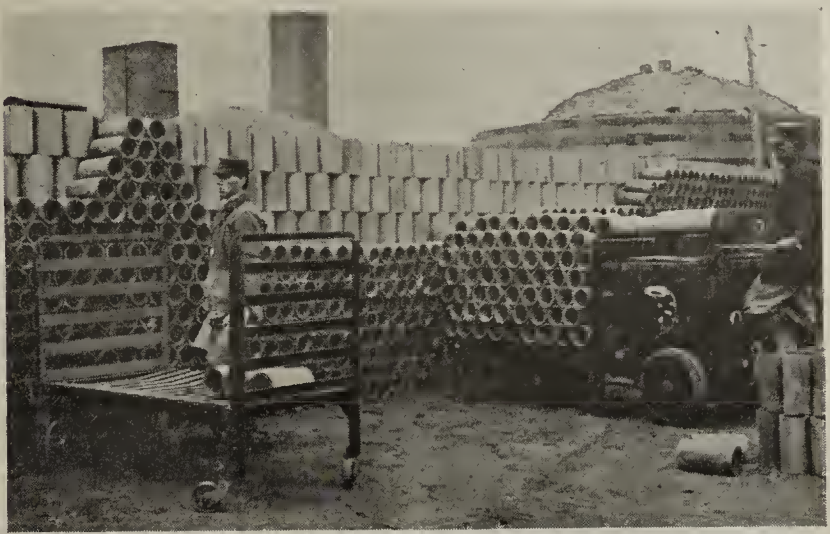
Of course, where this truck is used, it is advisable to have the routes between the kilns and the loading platform or stock yard in good condition. It might be suggested in this connection that where such a kiln-emptying system is contemplated, the runways be paved with brick. This would add to the economy of operating the truck, eliminating all jar and increasing its speed, and therefore its efficiency.

As may be readily seen, the advantages of this method of transferring the finished ware from the kiln to the stock piles or cars are many. Besides saving much in the amount of labor required for this work, it makes the loading of cars at a distance from the kilns possible, the expense of which would otherwise be prohibitive. This system also permits the stocking of more material in yards, the storage battery transfer truck having a much greater radius of economical operation than the man-propelled wheelbarrow.

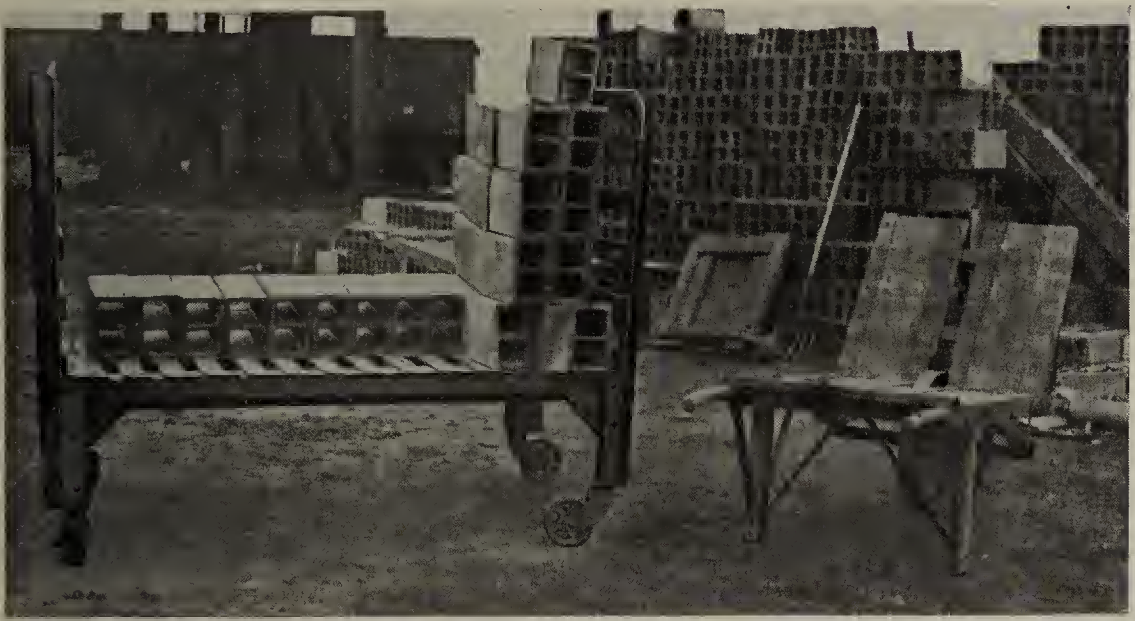
According to the owner of the plant at which the truck here shown is in use, the investment will pay for itself in one year, or at the very most, in two years. There was just one difficulty that was encountered when the system was first put in operation. At that time the racks had no castors and it was found that, in setting the racks down as the truck was slowing up, the legs would become bent. After two or three racks were damaged in this manner, it was decided to put on casters. This solved the difficulty, adding much to the life of the racks.

Cutting manufacturing costs is the best way of increasing the profits of a clayworking plant. Prices may fluctuate and competition grow more and more keen; but the economies that reduce cost go right on earning dividends, despite the vagaries of the market. "A penny saved is a penny earned" is here given a new significance.

While it is not possible to adopt every new method or device that is offered, even tho each and every one of them has merit, the wide-awake superintendent investigates them, in order to know whether or not any one is the best thing for him. Here, then, is a proposition that has proved itself on at least one plant—it is at least worth your better acquaintance. You know what the "wheelers" are costing you—why not find out what you will save by discarding nearly all of them, and substituting electric power?



Unloading the Steel Racks in the Storage Yard. No Time Is Wasted Here. Laborers Piling the Ware Are Kept Busy and So Is the Truck, Which Deposits Its Load, Picks Up an Empty Rack and Returns to the Kiln



The Old and the New. On the Right Is Shown One of the Old Wooden Wheelbarrows Formerly Used, and to the Left, Its Successor—an All-Steel Rack Which Has a Carrying Capacity of Between One and Two Tons of Ware

It might be said in passing that the utility of the truck here shown and described extends beyond the transporting of finished ware from the kilns to the loading platform or stock piles. It has a large enough tractive effort and is built sufficiently strong to move an empty freight car.

Since most plants use electricity in some form, either for power or for lighting, the charging of the battery on the truck is made a simple matter by a few changes in the wiring—if this is necessary—or possibly the installation of a transformer, depending upon the character of the current.

Wanted—Brick Silo Pictures

During the past two or three months, "Brick and Clay Record" has received numerous inquiries for literature on brick silos, particularly with reference to their suitability and method of construction.

Plans are now being made for the writing of a booklet on brick silos to be sold to the subscribers of this magazine for a nominal sum. We have sufficient data and information on hand for this purpose, but lack good pictures, especially those of brick silos which have been in service for some time and which have proven their worth. There are, no doubt, many of these silos in existence, but we have no way of knowing where they are. If you are making a brick that is suitable for silo construction and know of some silos built of your brick, you can help us, and help yourself by sending us whatever pictures you have, or have none, advise us where such silos have been erected so that arrangements can be made for the taking of one or more pictures.

Wants "Rug Textured" Face Brick in New York

If you are one of the manufacturers of face-brick who is making a vertical textured brick—something like the "Greendale Rug" in texture, even tho not in color—there is a dealer in New York who has a large following and who would be able to dispose of some of these brick for you if he had your account.

At the present time he finds that nearly all of his competitors have something to offer in the way of a "rug" but he has nothing, and as a consequence is frequently compelled to see perfectly good business go out of his office just because he is not able to show a sample and name a price.

"Brick and Clay Record" will be very glad to put any of its subscribers into communication with this dealer if the proposition looks interesting from either standpoint.

Elzey and Ragland Do Some Advertising

One of the most forceful advertisements that has recently appeared in the daily papers is the one inserted by E. P. Elzey (Hugh N. Ragland, associate), in the Parkersburg, W. Va., "Sentinel," where display copy measuring 11 by 10 inches was carried, with the catch-line "Economy—Fitness—Permanence" and sub-heads that brought the story of brick home to every would-be builder. Among these sub-heads, which were short and pithy, were "Cost no More," "Last Longer," "Increase Value," "A Safer Building," "A Priettier Building," "A Better Building," "No Repairs," "No Upkeep," "Less Insurance" and "No Depreciation." Under the spread "A Brick for Every Building" was given a list of a number of prominent buildings in Parkersburg and vicinity to which this firm has supplied the brick, with the admonition "See Any of Them"—the whole being an excellent sample of a business-bringing advertisement.

We are sure that Mr. Elzey and his associate have reason to congratulate themselves upon the results of their investment in newspaper display advertising.

Valentine Celebrates Fiftieth Anniversary

M. D. Valentine & Bro. Co., of Woodbridge, N. J., celebrated its fiftieth anniversary with a very beautifully glazed paper weight, in which the years—1865-1915—are prominently shown. The paper weight is of well burned clay, and bids fair to resist frost, and fire, and flood, and time for at least another half century.

Paul B. Belden

ON our left we have—as they say on the sight-seeing "busses"—Paul B. Belden, of Canton, Ohio, who was recently elected President of the American Face Brick Assn. On the right we find G. P. Anderson, who has taken charge of the face-brick department of the Wisconsin Lime and Cement Company, in Chicago.

G. P. Anderson

Pushing Paving Brick in Ohio

One of the most extensive campaigns ever inaugurated by any paving-brick interest to further the use of its product, is now under way in Ohio. The Ohio Paving Brick Manufacturers' Association is sponsor for the movement, and it is likely that the spring of 1916 will see a demand unique in the annals of the industry in the Buckeye state.

The campaign is being given the personal attention of G. O. French, of Canton, who is president of the association, James R. Marker, secretary and chief engineer, of Columbus, and Charles J. Deckman, of Cleveland.

Six experts—men with engineering experience, or who are engineers—are now in the field. The state has been divided into six sections, and under the direction of these experts, it is believed every county road now unimproved, will be covered. These men will not only give attention to the country roads, but to the unpaved city streets in their respective districts. The staff includes W. M. Edison, John Laylin, E. W. Ellis, J. C. Kennedy, T. Brindle and L. Stoner.

They will confer with farmers, urging that the latter adopt brick to improve their roads, and further urging them to use their influence on county officials to that end. Township authorities will be interviewed, and town and city officials as well. These experts have already been in the field for two months and will keep up the work right through the winter. Results of their efforts, as compiled in reports, will be announced later in the columns of this magazine.

Night Class in Pottery Established at Trenton

To make even more attractive the night school classes for workingmen, the Trenton (N. J.) Board of Education has decided to establish an evening class in the manufacture of pottery. A room in the plant of the Thomas Maddock's Sons Pottery Company has been provided free of charge, the city paying for the services of the teacher.

This innovation will be made to let the men living in the neighborhood of the pottery feel that they are at liberty to attend the class under less formal circumstances than some think they can do at present. These men, the majority of who work in the pottery by day, will be welcomed in the clothes they wear in the shop.

Archibald M. Maddock, president of the pottery, has taken a deep interest in the advancement of his men and for some time has had a private class in the trade in the afternoon. A local high school teacher has been employed by the firm to give the course of study in the afternoon, but the evening class, it is believed, will furnish more men with an opportunity to improve their skill.

The Price That Pays

What Shall We Add to the Cost of Making Face Brick to Insure the Proper Dividend on the Capital Invested in the Plant?

EDITOR'S NOTE: No business can be successfully conducted that does not base the selling price of its product upon its cost of production. So a thoro knowledge of cost is the first essential, and immediately following it comes the courage to set a selling price that will produce a satisfactory dividend. The author of this article, which is a paper read before the recent convention of the American Face Brick Association, shows common errors of price making and the only way of arriving at "The Price that Pays."

By W. H. Hoagland

General Manager, The Claycraft Brick Company, Columbus, Ohio.

AT THE TIME the American Face Brick Association was in the process of formation, I was sitting with a group of face-brick manufacturers who were discussing the assessment to be paid into the Association; one of the gentlemen present argued against paying an assessment on cull brick, on the ground that culls had to be sold for less than cost. At his factory, 20 per cent of the output was sold at $4 per M., or $3 below cost; he was willing to pay on seconds, altho he realized no more than cost out of that grade.

I remember asking him what price he got for first quality brick and his answer was that his regular price was $9 per M. but that competition often forced it down to $8. From the figures given by this brickmaker, it was easy to make the following deduction:

If 20 per cent of his output were culls, surely as much as 10 per cent would be seconds. Therefore, out of 100,000 brick produced, 20,000 would be sold at a loss of $3 per M., or $60; 10,000 would be sold at no profit, and 70,000 would be sold at an average of $1.50 per M. above cost, or $105. Deducting the $60 lost on the cull brick from the $105 gained on the first quality brick, he would have left $45 profit on the 100,000 firsts, seconds, and culls, which is equivalent to 45c per M., *or about 2½ per cent on the capital necessary to operate a plant of 12,000,000 yearly capacity.* This leads up to the question, which is—*what margin of profit should a manufacturer of face-brick figure on first quality stock in order to pay a reasonable return on the money invested?*

Many of us believe that a clouded vision of this question has had a great demoralizing effect on the selling price of face-brick. It is an old story to tell that the first vision of the newly-made face-brick manufacturer is a sure profit of from $4 to $6 per M. on the maximum capacity of his plant. He has been told that the cost will not exceed $6 (the figures used here are for the purpose of illustration only) and that the selling price will run from $10 to $12 per M., which will leave a profit sufficient to pay 25 per cent or 30 per cent on the capital invested. He may have $175,000 invested in his business, and has figured that 15 per cent return on this capital will be satisfactory. His plant having a capacity of 40,000 brick per day will produce 12,000,000 in a year, and a margin of $2.17 per M. will be sufficient to earn $26,000 for 15 per cent dividends. Therefore, a sale price of $8.17 is found by adding the $2.17 to the $6.00 cost, and when he finds his competitor quoting $9 he drops to $8.50 per M. with a feeling of security as to his profits.

As time goes on, he discovers that many items in his costs are exceeding his first estimates. The repairs are increasing as the plant grows older, and the depreciation of machinery, kilns, and buildings, and the exhaustion of clay deposit add to his cost a considerably greater amount per M. than he had anticipated. He then discovers that it takes $7 instead of $6 to make a thousand brick, and that his plant will average, per year, about 9,000,000 over a period of several years, instead of 12,000,000 or 40,000 per day for every working day in the year. He then realizes that a new selling price must be established.

To earn 15 per cent on the capital stock, the business must return $26,000 in profits, and this divided by 9,000,0000 tells him that $2.90 must be added to his cost of $7, and he thus decides on a new selling price of $10 per M. After going a year on that basis, however, it is found that his profits are much less than half of what was expected. The reason for it is that 20 per cent of his output are culls and sold at a loss of $3 per M., 20 per cent are seconds (on which he breaks even) and 60 per cent are sold at $3 above cost, which figures into an average of $1.20 per M. gain on the whole output, or about 6 per cent on the investment—instead of 15 per cent.

Now let us see what the selling price of first grade brick must be to earn 15 per cent, or $26,000. Twenty per cent of 9,000,000 is 1,800,000, on which a loss is realized of $5,400—they having cost $7 per M. to make, and only sold for $4 per M. Twenty per cent of the output being seconds and sold at cost, there is left only 5,400,000 of first grade brick to earn the 15 per cent dividend of $26,000, plus the loss on culls of $5,400, *making a total of $31,400 to be earned by first grade product.*

This amount, divided by 5,400,000 gives $5.80 per M. to be added to the cost of $7—making a new sale price of $12.80 per M. for first grade brick, and at the beginning, as you will remember, this manufacturer thought a sale price of $8.17 would yield a 15 per cent dividend.

But to base this argument on figures that would seem reasonable to all of you, I asked our Secretary to get the opinion of a number of prominent face-brick manufacturers on the following questions:

No. 1—What amount of capital do you consider necessary to purchase clay or shale lands, build a factory, and furnish ample working capital for a maximum capacity of 40,000 face-brick per day? The answer to this question to cover the total amount invested and borrowed.

To this question we received ten replies, ranging from $125,000 to $225,000—the average being $173,000.

No. 2—What per cent of profit on the capital invested do you consider would be reasonable for a brick manufacturer to expect?

Ten replies to this question ranged from 10 to 20 per cent, the average being 15.5 per cent.

No. 3—In your opinion what per cent of the maximum capacity of all the face-brick in the United States has been absorbed by the market during the past five years?

These replies ranged from 50 to 85 per cent, and the average was 70 per cent. On this question I quote the following from one of the letters: "To have this question cover a period of five years gives little real information for the reason of the enormous increase in plants manufacturing face-brick within the last three years, on account of the letting down of the bars by the introduction of rough-faced brick, permitting a multitude of common-brick plants to manufacture face-brick. At the present time the capacity of the face-brick plants of the country is enormously beyond the consumption."

In the following illustration, however, I will use 75 per cent, just to be liberal in demonstrating the point.

No. 4—Of the quantity produced, what per cent would be cull brick?

We received ten replies to this question ranging from 1 to 25 per cent, the average being about 10 per cent.

No. 5—At how much below cost do you think culls are being sold?

The average of all answers to this question showed $2.78, the range being from $1.50 to $5.

No. 6—What per cent would be second quality?

The answers to this ranged from 4 to 35 per cent, the average being 14 per cent.

No. 7—At how much below or above cost do you think seconds are being sold?

The answers to this question were rather indefinite and aside from figures given I quote two answers as follows: "If cost price can be secured for the average sale of second quality brick, the manufacturer is doing well." Another saying: "Believe the average to be about, or possibly a trifle over cost." Others gave figures of $1.00 above cost, and one gave $1.50.

For the purpose of illustration we will assume that seconds are being sold at cost.

No. 8—What per cent would be first quality?

These answers ranged from 40 to 90 per cent but were simply arrived at by deduction, adding the culls and seconds and deducting from 100 per cent.

The above estimates, tabulated, present the problem:

Capital invested	$173,000
Earnings necessary to pay 15%	$26,000
Capacity of plant	12,000,000
Market will absorb	75%
75% of 12,000,000	9,000,000
Culls 10% of 9,000,000	900,000
Seconds 14%	1,260,000
First quality 76%	6,840,000
Culls sell at $2.78 below cost; seconds at cost.	
900,000 culls @ $2.78 below cost (loss)	$2,502
Profit necessary to earn 15% on capital	$26,000
Amount necessary to add to the cost of first quality brick	$28,502
$28,502 divided by 6,840,000 equals	$4.16

Therefore, if we have a cost of $7.00 and other conditions as shown by these average estimates, we must secure for first quality brick $7.00 plus $4.16, or $11.16. If we have an average cost of $9.00 the selling price must be $13.16.

I would suggest that you substitute your own figures in place of the ones given herein, and by this plan figure out how much you will have to add to your average cost to make the sale price on your first quality brick high enough to realize the dividend which you think you should earn on your capital stock. I venture to say that many of you will be surprised to find how much below the sale price so found you are now selling your brick.

I know from personal contact with other manufacturers that many of them fix their first quality sale price without taking into account the quantity of low grade brick which must be sold at cost, or below, their one idea being that any amount realized for first grade brick above the average cost of all brick made, is a profit for dividend paying, when, as a matter of fact, this so-called profit may in reality mean a loss.

After I had figured from the average of all the estimates sent in by the several manufacturers, I then made a computation of each individual set of figures and it is very interesting to note the spread in the final results.

Taking each man's estimate of the capital required for a 40,000 brick per day plant, his idea of the per cent of dividend that should be paid, the average yearly market consumption, the per cent of seconds and culls, and sale value above or below cost of same, I got a list of figures showing the amounts to be added to the average cost of first grade brick as follows: $2.57; $3.04; $3.40; $3.41; $3.80; $3.86; $4.00; $4.08; $4.56; $4.57; $6.65.

Then I took each set of estimates and calculated the first-grade-margin-of-profit necessary to pay 15 per cent on the various estimates of capital required, and I got the following: $2.54; $2.57; $3.03; $3.08; $3.42; $3.80; $3.86; $4.29; $4.43; $4.90 and $8.40.

It is of further interest to exhibit the highest and the lowest estimates. First taking the one showing $8.40 necessary to add to the cost to pay 15 per cent dividends, we have:

Capital invested	$225,000
Earnings necessary to pay 15%	$33,750
Capacity of plant	12,000,000
Market will absorb 80%	9,600,000
Culls 25% of 9,600,000	2,400,000
Seconds 35% of 9,600,000	3,360,000
First quality	3,840,000
Culls sell at $1.50 below cost.	
2,400,000 culls @ $1.50 per M. below cost (loss)	$3,600
Seconds sell at $1.50 above cost.	
3,360,000 seconds @ $1.50 per M. above cost	$5,040
$5,040—$3,600 equals net profits on culls and seconds	$1,440
Profit necessary to earn 15% on capital	$33,750
Less profit on culls and seconds	$1,440
Profit necessary to earn from sale of first grade	$32,310
$32,310 divided by 3,840,000 equals	$8.41

What rate of dividend could a manufacturer, confronted with conditions such as these, pay, if he fixed his sale price of first quality stock at $2.00 per M above seconds—which is a rule with many makers?

Figuring it out: 3,840,000 first grade brick at $3.50 above cost, equal $13,400. Profit made on culls and seconds, $1,440. Total profit, $14,880.

$14,880 will pay dividends on $225,000 at the rate of 6.6%.

Now take the set of estimates showing $2.54 necessary to add to the cost to pay 15% dividends and we have:

Capital invested	$150,000
Earnings necessary to pay 15%	$22,500
Capacity of plant	12,000,000
Market will absorb 80%	9,600,000
Culls 1% of 9,600,000	96,000
Seconds 9% of 9,600,000	864,000
First quality 90% of 9,600,000	8,640,000
Culls sell at $3.00 below cost.	
96,000 culls @ $3.00 per M below cost (loss)	$288.00
Seconds sell at $1.00 above cost.	
864,000 seconds @ $1.00 per M above cost (gain)	$864.00
$864—$288 equals net profits on culls and seconds	$576.00
Profit necessary to earn 15% on capital	$22,500.00
Less profit on culls and seconds	$576.00
Profit necessary to earn from sale of first grade	$21,924.00
$21,924 divided by 8,640,000 equals	$2.54

A manufacturer with only $150,000 invested, getting only 1% culls, and 9% seconds—the latter selling at $1 per M. above cost—would be very foolish if he sold his first grade brick at less than $2.50 above cost, for it would appear from the various estimates which have come in, that he would be in an exceptionally favorable position to get a price that would give him that margin.

For the purpose of comparison I will exhibit a set of figures sent in by a manufacturer who is located down in the hills, manufacturing face-brick from mined clay, and who is placed at quite a disadvantage in marketing cull brick, having practically no local demand and being quite a distance from any large town or city where any considerable quantity of culls can be disposed of. His figures are intended to express his idea of an average of all plants thruout the United States, and his viewpoint compares very closely with the estimates given by other manufacturers who are similarly located.

Capital invested	$200,000
Earnings necessary to pay 10%	$20,000
Capacity of plant	12,000,000
Market will absorb 70%	8,400,000
Culls 10% of 8,400,000	840,000
Seconds 10% of 8,400,000	840,000
First quality 80% of 8,400,000	6,720,000
Culls sell @ $3.50 below cost (loss)	$2,940
Seconds sell at cost.	
Profit necessary to earn 10% on capital	$20,000
Amount necessary to add to cost of first quality brick	$22,940
$22,940 divided by 6,720,000 equals	$3.41

You will note that this man's idea of the earnings that should be made on a face-brick investment is very much below the average of the other estimates sent in, so we will use his set of figures in making another exhibit, substituting an earning rate of 15% instead of 10%, and we have the following:

Capital invested	$200,000
Earning necessary to pay 15%	$30,000
Capacity of plant	12,000,000
Market will absorb 70%	8,400,000
Culls 10% of 8,400,000	840,000
Seconds 10% of 8,400,000	840,000
First quality 80% of 8,400,000	6,720,000
Culls sell @ $3.50 below cost (loss)	$2,940
Seconds sell at cost.	
Profit necessary to earn 15% on capital	$30,000
Amount necessary to add to cost of first quality brick, $32,940 divided by 6,720,000 equals	$4.90

In computing your costs it is highly important that you charge off an ample amount to cover depreciation of plant and exhaustion of clay deposit. I know of a brick manufacturer who charged off no depreciation, but argued that he kept the plant in a perfect state of repair and charged up all such expense to repair costs, stating that his plant was worth just as much at the end of any year as it was when it was new. This manufacturer had a fairly good dividend paying record, but finally, after about fifteen years of operation, his clay deposit was completely exhausted and the plant dismantled and sold for junk.

In summing up all of the dividends paid during the life of the plant, and adding the amount received for salvage, it was found that only a little more than the original investment had been returned to the stockholders—so that this plant, which had been considered highly successful, had earned no interest on the money that was tied up in it during so many years, and during all of that time there was no margin of profit added to the true cost of making the brick.

If you have a clay deposit which will be exhausted in forty years, and you have a $200,000 investment in a plant which will have to be sold for junk at the end of that time, you should charge off at least $5,000 per year for such depreciation, and this item alone will amount to 50c per M. on 10,000,000 production. I am not suggesting that you arrive at your depreciation charge in this manner, as any accountant can advise you specifically, if you do not know how to make your charges against this item. *But do not think that, having a deposit of raw material which will last for thirty, forty, or fifty years, a charge for exhaustion and depreciation is too small an amount to be given serious consideration*, for it may amount to the whole profit you think you are making.

In these remarks the cost figures to which I refer cover all expenses of:

Mining, or gathering, and preparing clay,
Making brick,
Drying labor,
Drying fuel,
Oil, grease and waste,
Power labor,
Power fuel,
General yard labor,
Repair labor,
Repair materials,
Setting labor,
Sand for setting,
Burning labor,
Burning fuel,
Sorting,
Loading labor,
Straw used for packing,
Exhaustion of clay deposit,
Depreciation of plant,
Factory overhead,
Administration,
Selling expense.

And to arrive at your cost per M. you are not to divide by the number of brick made at the machine, nor the number set, burned, or sorted, *but you should divide by the quantity of merchantable brick you can see in your stock sheds* *at the end of the year,* added to the quantity your books show you have shipped during the year, taking into account by deduction, however, the quantity in stock at the beginning of the year. By this method you eliminate all losses in drying, setting, burning, sorting and handling in stock sheds; also all errors in the count of brick loaded, *for which you receive no money,* and all brick "Lost, strayed, or stolen."

In establishing a price on first grade brick, it should be made enough higher than the cost so found to cover safely the losses in bad accounts, allowances made for one reason or another, discounts, etc., as well as the losses on the culls and low-grade brick.

When a sale price has been found that will return a reasonable profit on the capital invested, a determined effort should be made to make sales at that price. Urge your salesman not to be afraid to lose an order. When the buyer offers him an order for 100,000 brick at a cut of $1 per M. he must not be afraid to say "No." There are a lot of times the buyer is "bluffing", and even if he is not and your competitor gets it, the chances are he will stiffen his price the next time he meets you in competition.

When your salesman realizes that you are in earnest and that he can no longer depend upon a cut in price to secure the business, he will begin to study selling arguments that will possibly secure the business for his product, in face of the competitors' lower quotation.

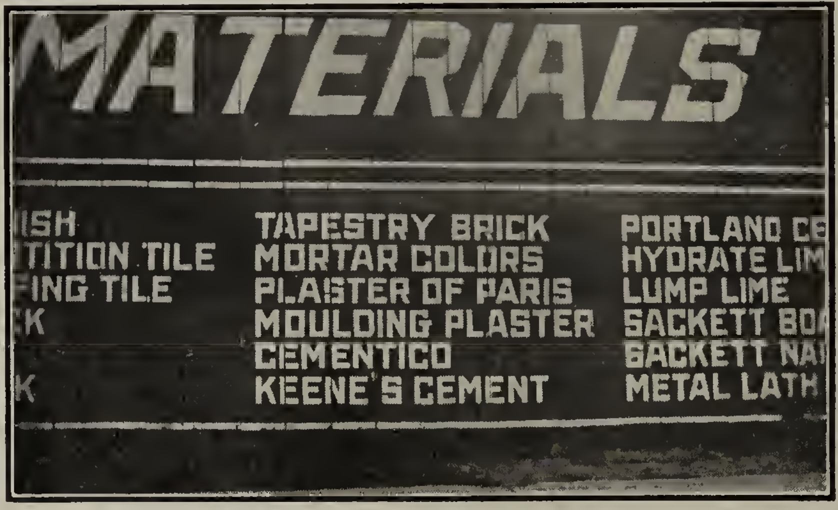
Prices have been advanced in nearly every other line of manufacture, even in other lines of building material, and the face-brick trade has been in such a deplorable condition for so many years, it would seem that now we should make up our minds that if men in other lines can advance their business to a profitable basis, we also can do it. If the facts and figures that I have given in the foregoing paragraph suggest a line of thought which may lead to a greater profit in the future, I will feel very thankful and well repaid for presenting them.

Protecting the "Tapestry" Trademark

Affixing a trademark to a burned clay product is something of comparatively recent origin. Being something new, it seems necessary that it must suffer all of the annoyances that come from carelessness and ignorance as much as from vicious infringement.

The brickmaking industry will, some day, have cause to thank Fiske & Company, Inc., for the militant attitude it has taken in connection with its trademark—the famous "Tapestry."

The wirespread publicity given this trade name has caused it to be regarded as descriptive of a certain type of brick—that is, face-brick with a rough surface. Many brickmakers have grown accustomed to say "Tapestry" when they mean rough surfaced face-brick, and are so led to use the trademarked word in their advertising and when this happens, it does not take very long for a formal protest to reach them.



The Sign that Infringed a Trade Mark

J. Parker B. Fiske, vice-president of Fiske and Company, Inc., has a very forceful way of expressing his opinion in this connection; in a recent correspondence which he had with the Buffalo office of the U. S. Gypsum Company, he said:

> We supposed by this time that everyone in the building business was familiar with the fact that the word "Tapestry" was a trademark, registered in the United States Patent Office and the exclusive property of Fiske and Company, Inc. It is just as much the legal name of our product as the United States Gypsum Company is the legal name of your concern and you have no more right to use the word "Tapestry" in connection with a product that is not manufactured by us than the writer would have to go about the streets of Buffalo representing himself as one or another of the officials of your company.

The occasion of this correspondence was a sign which the United States Gypsum Company had built in front of their Buffalo yard and replying to the letter which is above quoted, their local manager made the statement that he had painted out the offending words and that in the future he would be very careful not to mention the word "Tapestry" in connection with any of the brick which he was selling.

Another instance, in which the misuse of the word was unintentional, happened in one of the Pacific coast states and formed a part of an advertisement placed in one of the local papers by a concern headed by one of Mr. Fiske's personal friends. This was explained later by the fact that the gentleman in question had not been consulted when the advertisement was written and the man who was doing the publicity work had not received a thoro schooling in the matter of trademarks.

Another instance that recently arose was the case of a concern in the south and in this case the offending parties, answering the protest which had been sent them by Fiske and Company, said:

> "We were unaware until a few days ago that the name 'Tapestry' was a trademarked name of your brick; we were under the impression that 'Tapestry' was the name generally applied to all rough textured brick and that it was used by you and by others in this sense. Our use of the name arose from the fact that all rough textured brick coming to this market, with which we are familiar, are usually spoken of as 'Tapestry' brick by the users of the same; we have also noted the word used in the journals to designate the rougher textured brick, hence we used it to discriminate between our rough textured and smooth face-brick."

When a man decides that he makes something so excellent or so different from that which is made by anyone else that it is well to designate it by a trademark, he naturally selects some name which is easily remembered and which, while it will evade the restrictions of the patent office (which are that it shall be neither geographical nor descriptive) will convey some idea of the product to the mind of the man who sees the name. The better the name, therefore, the more apt it is to push aside all other descriptive titles that have been applied to similar material.

Just as soon as it does attain this position, a new danger confronts the man who owns the trademark. The word runs away from the owner and applies itself to a class of materials rather than to a specific product. To checkmate this, the owner of the trademark must be ever on the alert to stop all public use of the trademark except in connection with his own product and it is only by this "eternal vigilance" that he protects his rights and builds a valuation around the name which he has adopted.

Face-Brick Company Builds Test Roads

The experimental construction of roads in St. Louis county, Mo., for the purpose of furnishing practical examples of the durability of materials for the county engineers, is now practically finished. On the Clayton road at the intersection of the North and South Roads near St. Louis, the Hydraulic-Press Brick Company has completed a strip of brick paving. The improvement consists of a central square with arms stretching in all directions. The paving was laid on a concrete base with a grout filler. The work was done with the understanding that the county is not to pay for any part of the paving if it is not in perfect condition at the end of nine months. If, however, the paving stands up well, the county is expected to pay for it at the rate of $1.50 a square yard.

At this point the Hydraulic-Press Brick Company has also constructed a strip of road consisting of brick laid on an old macadam base. This work was done for $1.25 a square yard and the county engineers are to observe how it stands up as compared with the brick laid on the concrete base.

"Buying Well"

Actual Happenings in Clay Plants Where the "Economy of Buying Well" Has Been Convincingly Demonstrated

EDITOR'S NOTE: The man with the lowest production cost is intrenched against the invasion of cut-price competition. Good machinery and good management go hand in hand, one being useless without the other. The profits of many a clayworking plant have been thrown away by the false economy of someone who believed he was "getting a bargain" when, in fact, he was paying a price out of all proportion to the value of the equipment he was purchasing.

YOUR experience in purchasing machinery and equipment is, in all probability, entirely different from that of other clay plant owners. For that reason, it will interest them—just as the "stories" told below have interest for you.

Won't you contribute your share to a great movement for the betterment of the industry, by writing us a letter on the subject of "Buying Well"?

The Story of a Drier That Was All Right on Paper But All Wrong on Brick

A brickmaker who was in the market for a drier of 40,000 daily capacity had a number of "systems" offered him and finally bought the one which would cost him the least money per thousand capacity to construct. That is, it figured that way on paper.

He was advised that the drier was not suitable for the kind of material he was using, and that it could not "come across" with its claims—at least, not on that plant. All he could see was the lower first cost, and he turned a blind eye to everything but the dollar sign and the figures that followed closely after it—on paper.

The drier cost him $10,000. Instead of drying 40,000 brick in a day, it would only dry 22,000 and then with heavy drying losses and at a cost of nearly $1 per thousand brick.

It was finally dismantled and $8,000 more was spent in the installation of another system. The last one is "producing" its full quota of 40,000 brick every day, and at a cost close to 25 cents per thousand brick.

The Story of a Salesman Who Wore Down the Buckets When He Sharpened His Pencil

In a certain clayworking plant, the management was prevailed upon to install a complete elevator system—two, in fact. The size of the first installation, and the fact that it represented a considerable outlay, caused the manager to tell the salesman who was due to get the order, that he would have to figure on the very cheapest material he could find for the purpose.

For a full month after the first conveyor was put in, the plant was shut down fully five hours out of a ten-hour day, simply because the buckets were so thin that they bent out of shape and pulled off of the thin, cheap belts furnished.

The plant was then completely shut down, and new belts, buckets, boots and pulleys were put in. Since then the management has forgotten what elevator trouble is.

The original installation cost several thousand dollars more than the later one—that is, when due consideration is given to the production loss that it caused.

The Story of a Cub Who Offered to Pay for a Belt If It Failed to Live Up to His Expectations

"On a plant which I was employed to operate, when I was a 'cub,'" writes a well known ceramic engineer, "was a swing hammer crusher with a pulley speed of 1,200 R. P. M.

"I was told a belt could not be gotten that would last more than thirty days on that machine (it was outside, and exposed to all weather conditions).

"I looked up the price of the belts that had been purchased, and found that they were the cheapest on the market. I advised buying a ———, but was told that they were too expensive.

"In the first five months that I was on that plant, six cheap belts were bought, the general manager acting as purchasing agent. I then prevailed upon him to buy the belt that I had recommended, offering to pay for it myself if it did not do better than the others had done.

"The new belt stood up for a year, when the crusher was displaced by a dry-pan. It was then put on the pan and, altho the pan called for a 12-in. belt (the one we had been using was 8 in.) the old belt was still running and doing its work three years later, when I left."

The Story of a Low Priced Machine That Only Ran to Capacity When Running Up a Repair Bill

It will be remembered that in the article "Running a Plant to Capacity," A. F. Greaves-Walker wrote of a very successful clayworking plant in Ohio, where, pushed into an out-of-the-way corner was a complete and very fair looking hollow-ware machine. It had been discarded because it "was not a dividend producer."

It appears that, when this machine was bought, the salesmen who were figuring on it were asked to submit prices on a machine with a daily capacity of 100 tons. One company was, of course, the low bidder and—altho not "of course"—got the business. The machine averaged 75 tons a day, instead of the 100 tons promised, and it ran up a frightful repair bill.

It would run 100 tons when it did run, but that wasn't often. Finally, this manufacturer grew tired of tinkering with the machine and bought a new outfit—this time from another firm.

From the annual statements that are being shown, the new machine, guaranteed to produce 100 tons per day, averages more than 100 tons and is a smaller machine.

In the original bidding, this smaller machine, which does the work, was priced considerably higher than the larger machine that only ran to capacity when running up a repair bill.

New England Builders Waking Up

Some of the Italian builders are setting the pace for American born contractors—particularly in centers like Revere, Mass. Not only are they demonstrating the excellence of enamel brick—some of them being the first to use this material—but are employing craftsmen on their walls, with the result that pattern brickwork of excellent design is being done where, under ordinary conditions, cheapness in design and execution would be expected.

The National Fire Proofing Company's Revere plant is hauling tons upon tons of terra-cotta blocks out to the new building area in Allston, where a perfect fanfare of new apartments, hotels, stores and garages are going up.

The new Allston Storage Warehouse, in from the corner of Brighton and Harvard Avenues, is the latest. It is of brick, and solid as a fort. There is a sort of historical impetus about the making of this structure so solid; not only is it to be used to safeguard the neighborhood treasures, but it stands where once stood a Colonial residence—one that had been there for more than two hundred years.

Along the frontage of the surrounding avenues a string of artistically designed and well constructed store buildings have been erected—all brick, but with the much-to-be-regretted artificial stone trimmings.

In rebuilding the entire business section of Chelsea, which suffered from a Twelve Million Dollar fire a few years ago, there were used some of the finest Colonial designs that ever came from the boards of American architects. Competent critics say that the City Hall rivals the famous Independence Hall in Philadelphia.

It remained for a cold-blooded railroad corporation to put up what is said to be the finest terra-cotta building in Boston. The New York, New Haven and Hartford owns property that was formerly occupied by a hotel at the corner of Berkley and Boyleston Streets, and in planning a new office building for the site, decided upon a design embodying the intricate spire-effect of Italian cathedrals. Thus, the huge, twelve-story building has every window set in a terra-cotta tiling and wherever and whenever there was room for a terra cotta spire, that spire went on.

It is curious that, when there is so great a demand for brick, the famous old Foster brickyards on the Lynn Road should be idle. The death, however, of their aged proprietor put a stop to brickmaking in that section. Some of the property has been sold for building lots, but old General Demand will force the resumption of the claycrafter's work in that vicinity, very soon.

Again speaking of architectural terra-cotta, New England offers a fertile field for exploitation. The builders don't know as much about terra-cotta as the western builders seem to. It only remains to do some missionary work—and this can well be extended to the architects. The material will do the rest, as it has wherever it has been extensively used.

S.A.F.E. in a Tight Box

The Society Advocating Fire Elimination lives up to its "blue teapot," even in its Christmas souvenirs. This year, its friends and members received a japanned sheet-steel box, with rounded sides, ends and corners, just large enough to comfortably hold enough securities to make their possessor come well within the provisions of the income tax. On the lid there is an inscription: "Member of the Society Advocating Fire Elimination—A National Movement for Safe Building Construction."

Building Supplies Wanted!

A correspondent writes that the high prices being paid for zinc ore and lead in the Joplin (Mo.) district is causing the mine owners and employes, as well as business men that cater to the needs of the ever-increasing population of the district, to consider a great deal of new building, much of which will start in the spring. He says that this "building boom" will mean the replacement of many of the wooden structures that have outlived their usefulness, and that the new buildings will be of the most substantial character, which means that they will be built of brick or hollow-tile.

He adds that there is, right now, a big chance for a live concern which will handle all kinds of fire-safe building materials, and that a little investigation, made right on the ground, will verify every statement he has made.

The Calendar Crop

It is a little early, as yet, to close the books on the calendar receipts, but it will serve in passing, to record the fact that Clippert, Spaulding and Company, of Lansing, Mich., Yankee Hill Brick Manufacturing Company, of Lincoln, Neb., A. C. Ochs Brick and Tile Company, of Springfield, Minn., "Parry of Gary," George H. Clippert and Brother, of Detroit, and the Tuttle Brick Manufacturing Company, of Middletown, Conn., all have done their part to keep "Brick and Clay Record" from getting its dates mixed during 1916—the year of activity.

Building a Six Foot Segmental Sewer

The Steam Shovel

ACTUAL experience is worth much more than theory. The following article, written by the assistant engineer in charge of the work described, tells how one city solved its sanitation problem by using hollow clay block.

The Gasoline Engine

By Benjamin Wilk

FACING A PROBLEM in sanitation that included a new outlet sewer which would carry off all of the storm water and also act as an overflow sewer for the sanitary sewer system, the city of Virginia, Minn., figured on a sewer sufficiently large to take care of all future needs, as well as those of the present day. Accordingly the City Engineer, E. F. Johnson, was asked by the council to draw up plans for a 72-in. sewer, five thousand feet long, to be built either of segmental vitrified sewer block, or of reinforced concrete.

The segmental sewer block was untried, so far as northern Minnesota was concerned, but the City Fathers wanted to see what could be done with it, and were more than pleased when the bids for the work had been opened, and it was found that the segmental block sewer would cost several dollars per foot less than any other kind of construction. Consequently, the contract for a sewer built of vitrified clay segmental blocks was let to the low bidders, the Lawrence-McCann Company.

A 20-in. sanitary sewer to a creek one and three-quarters miles away from the center of the city, and several short storm sewers emptying into two lakes within the city limits had been taking care of the sanitary and storm water sewage. and the new 72-in. sewer was designed to run parallel to the 20-in. sewer from its outlet and for about three-quarters of a mile, until it would strike the Duluth, Winnipeg and Pacific Railroad, where it would curve and run parallel to the tracks, until the sewer would be brought to the main business street, where the storm water troubles had been greatest.

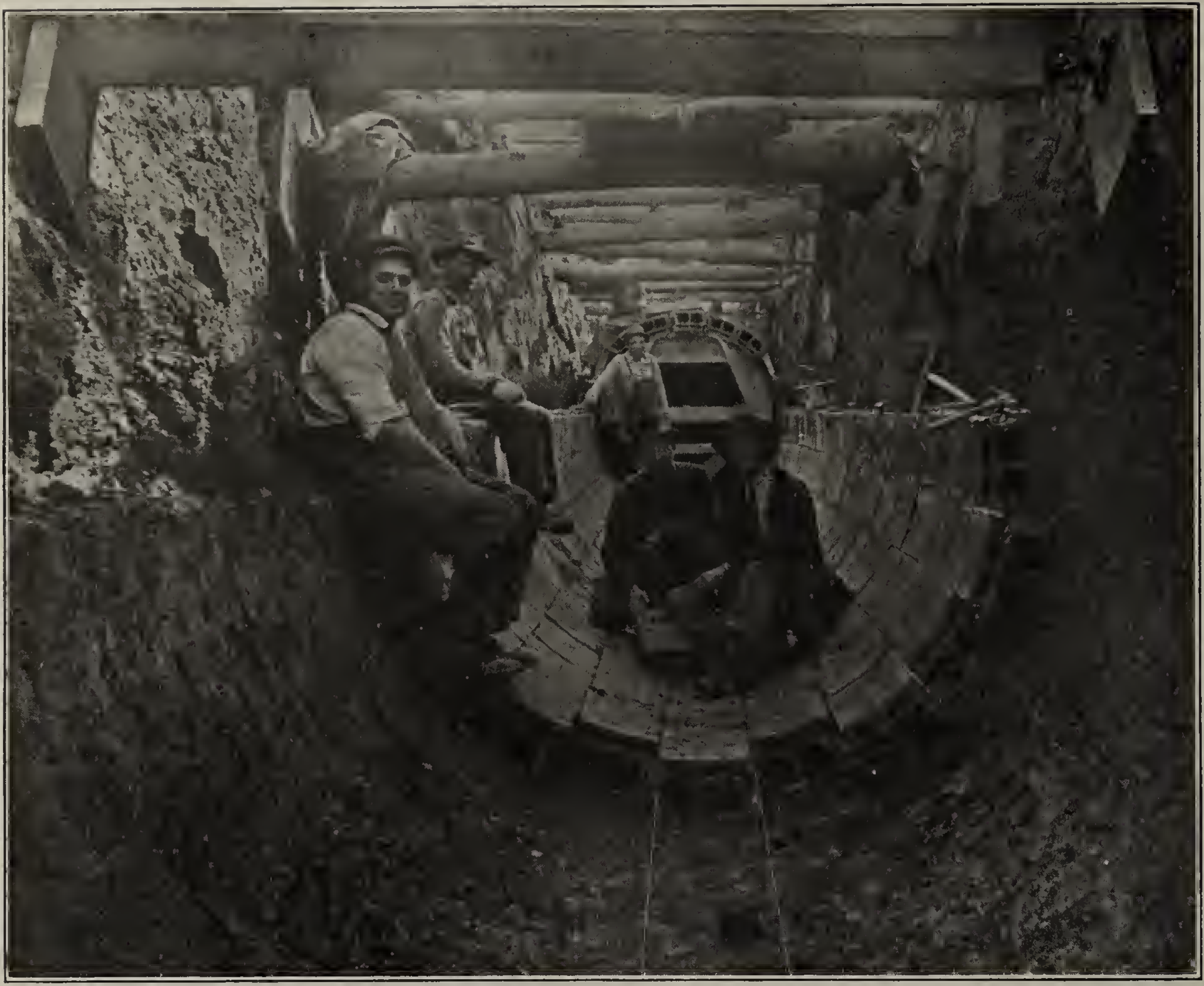
In order to keep within the right-of-way owned by the city and the railroad company, and not encroach on private property, as well as not be too close to the railroad tracks, it was necessary to lay out several curves. Three of these were simple railroad curves, varying up to 8 degrees in curvature, and 40 ft. in length, while a reversed curve of six degrees, 450 ft. long, was used. The excavating ranged from 12 ft. to 27 ft., and the sewer was laid on a grade of only eight-one-hundredths of one per cent, there being but little fall between the city proper and the creek into which the sewage was to flow.

Connections were made between the manholes on the old sanitary sewer and the new sewer (which was laid several feet below the grade line of the older work) and at a distance away of twenty feet. These manholes were spaced approximately one thousand feet apart on the new sewer.

Excavation for the segmental block sewer was commenced in August, 1914, and the sewer was completed the following January. An additional 4,110 ft. had been added to the original contract, in order to carry the 72-in. sewer up to the main street, making a total length of 9,110 ft. of sewer laid in about five months.

The work was begun at the outfall end of the sewer, and a trench 8 ft. wide was dug with a steam-shovel mounted on a swivel base, on trucks which traveled directly over the sewer, on 12-in. by 12-in. by 32-ft. timbers. The shovel moved ahead with its own power, taking up the timbers from behind, and swinging them in front of itself as it moved along. The boom allowed for direct digging down to 17 ft., but below that depth, hand-shovel digging was resorted to. The dirt was hoisted to the surface on skips, which were hooked to a cable attached to the end of a clamshell after the "orange-peel" had been taken off. The clamshell worked along one side of the ditch and was used as a back-filler when not used in the deep digging.

The digging, in the original contract, was almost entirely



"The Bottom of the Trench was Rounded Out to the Shape of the Sewer, as the Block were Laid Directly on the Hard Clay"

thru hard clay, and the excavating was done with much speed, but in the added length a great deal of rock was encountered, especially for a distance of 1,400 ft., and this impeded the progress of the work, as it occurred mostly in the deepest digging. This excavating was carried on night and day, as the pipe layers were right behind the excavating gang nearly all of the time.

On account of the nature of the ground, very little bracing had to be used. Supports were placed in the trench at 5-ft. intervals, and were made up of two 3-in. by 12-in. timbers, with two jacks across the trench. There was very little caving-in, except during a period of three weeks, when very heavy rains were almost constant.

In laying the pipe, care was taken to see that the bottom of the trench was rounded out to the shape of the sewer, as the blocks were laid directly on the hard clay; at first a 1-in. sand cushion was used on top of the clay, the blocks being placed upon this cushion. It was later decided that the hard clay itself would be sufficient, and the sand cushion was done away with.

In order that the bottom of the trench might be brought to the true shape, and also to the true line and grade, a template, built of boards to make the semi-circle, was used. This template was of a width equal to the width of the segmental blocks, so that when the inside of the lower part of the template was exactly at invert grade, the outside would show how much dirt had to be scooped out.

Grade and line were placed by the engineers on boards nailed to the jacks in the upper part of the trench, and the depth of the digging marked, so that the trenchmen could place their templates with accuracy. The templates were moved ahead as the bottom was rounded out, but one always was left in place for the block layers, so that they could stretch strings from the block already in to the invert grade at which the inside of the template rested.

On the straight stretches, the grades were set every 25 ft. by the City Engineering Department, but on curves both line and grade were set every ten feet. The strings joining the blocks already in with the template ahead, were stretched to govern the laying of the lowest block at the invert, as the rest of the blocks were placed at both sides of this invert block. This block was so laid that its center was the lowest point of the sewer. And, as the lower part of the sewer was then built up, the springing lines would also be in the center of the blocks at the quarter points, making a much stronger circle than if the joints were at the quarter points.

The blocks have dove-tail joints at the sides and ship-lap joints at the ends. Each block was 2 ft. long and 7½ in. thick, and weighed 90 lbs. Twenty blocks were necessary to make a complete circle. In laying, the blocks were staggered as in bricklaying, and the joints were filled with a rich mixture of sand and cement.

When the lower half of the sewer, up to and including the springing line, had been built ahead for 50 ft. or thereabouts (depending upon conditions) a semi-circular form for the upper half was shoved ahead in place. This form was about 16 ft. long, and rested upon a triangular base placed upon the lower blocks that were already in place. Men could stand upon these forms and lay the blocks as rapidly as they were lowered to them from the surface. The last block (to complete the circle) had to be shoved into place longitudinally.

"Supports Were Placed in the Trench at Five Foot Intervals"

"The Tamping-In of the Back-filling at the Springing Line Must be Well Done"

A coating of cement mortar was then smeared over all of the joints, both inside and outside of the sewer.

In order not to have very much of the trench open at any one time, back-filling was started shortly after the blocks were in place. Earth was thrown from the surface by laborers with shovels and then tamped in around the blocks at the springing line. When the springing line was taken care of, a drag-line attached to a gas-engine and also a clamshell were used to finish up the back-filling.

After the back-filling had been completed, men would go thru the sewer, pointing up any joints that might have opened up during the back-filling. Inspections were also made to see whether any part of the sewer that was completed was in other than first-class condition.

A considerable part of the sewer was built during the very cold months, and this part had been watched carefully to see what effect the spring rains would have on the work. Some of the back-filling done during the winter became saturated with frost, so that when the thaws set in, some of the earth in the trench settled, but these places were watched and the earth broken down so that there would not be much of a fall on the pipe.

A study of the benefits gained from the use of segmental vitrified sewer block in the city of Virginia shows that this form of sewer is considerably cheaper than any other form for larger sewer construction. In the laying of the blocks it was found that they could be laid much faster than any other construction, and that experienced bricklayers were not absolutely necessary. One experienced man to boss the block layers could handle ordinary laborers, and keep the work going.

The work done by the block layers was governed by the amount of available open trench that had been rounded out. The short lengths of the blocks made it easy to go around the curves in the line of the sewer. The hollow spaces in the pipe allowed for underdrainage, which otherwise would have required much piping. During the wet season, these hollow spaces were very effective in carrying off the surplus water.

In construction of this kind, extreme care must be used to see that the bottom of the trench is rounded out to fit the shape of the sewer, while the tamping-in of the back-filling at the springing line must be well done, as the pressure from the upper side of the sewer is brought directly to the springing line and any weakness at that point will result in the caving-in of the sewer.

From all indications this new form of sewer will be much used in the future, as it combines cheapness with ease and speed of construction. So successful was the work at Virginia on the 72-in. sewer, that the city itself laid 600 ft. of 30-in. sewer, and the city of Eveleth, four miles away, is now building 1,525 ft. of 36-in. sewer.

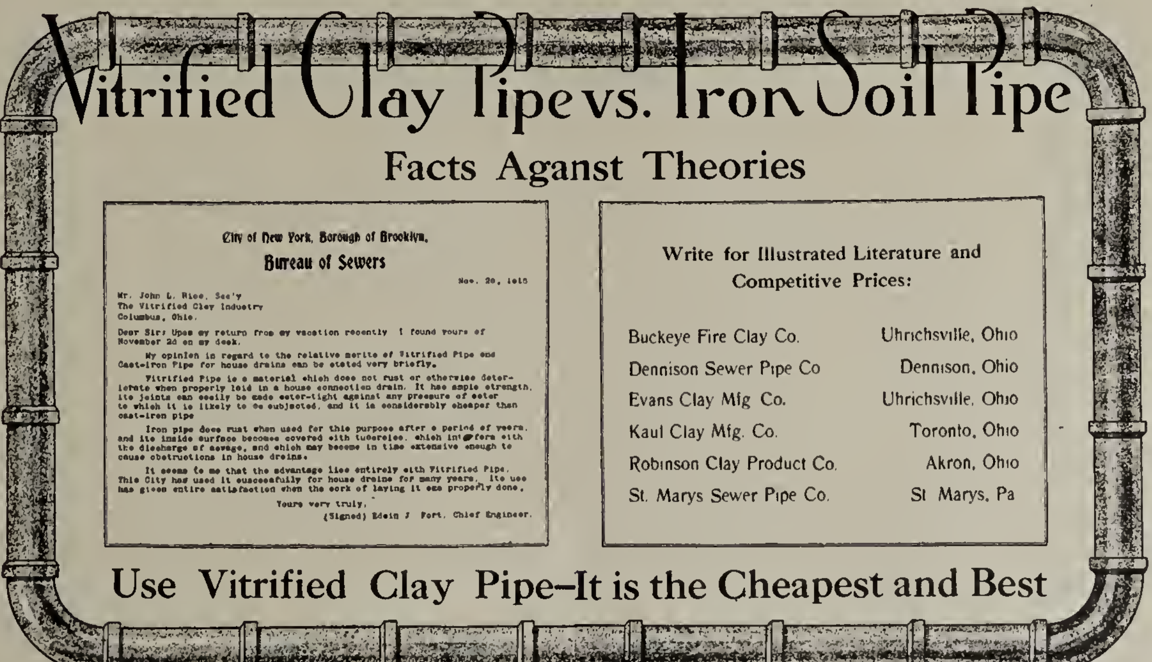
The segment block used at Virginia, Minn., was furnished by the Red Wing Sewer Pipe Company, of Red Wing, Minn., who are licensed manufacturers of this form of sewer pipe, along with the Macomb Sewer Pipe Company, of Macomb, Ill., and the W. S. Dickey Clay Mfg. Company, of Kansas City, Mo., under patents of the American Sewer Pipe Company, of Akron, Ohio.

Clay Pipe Men Advertise in Plumbing Journals

Thru "Domestic Engineering," one of the best known trade journals in the plumbing field, we are brought face-to-face with a new sign of the progressiveness of an important branch of the clayworking industry.

Here "community advertising"—the combined effort of several manufacturers—is directed toward a logical market. The contracting plumber is frequently called upon to figure on outside work, and, as has been aptly said, is prone to bid on the kind of material he knows something about.

Advertising in his own "pet" trade paper reaches the plumber as no other medium could. He will want to know more about vitrified clay pipe, because of having seen this advertisement, and so become its friend.



Vitrified Clay Pipe vs. Iron Soil Pipe

Facts Aganst Theories

City of New York, Borough of Brooklyn,

Bureau of Sewers

Nov. 20, 1915

Mr. John L. Rice, Sec'y
The Vitrified Clay Industry
Columbus, Ohio.

Dear Sir: Upon my return from my vacation recently I found yours of November 2d on my desk.

My opinion in regard to the relative merits of Vitrified Pipe and Cast-iron Pipe for house drains can be stated very briefly.

Vitrified Pipe is a material which does not rust or otherwise deteriorate when properly laid in a house connection drain. It has ample strength, its joints can easily be made water-tight against any pressure of water to which it is likely to be subjected, and it is considerably cheaper than cast-iron pipe

Iron pipe does rust when used for this purpose after a period of years, and its inside surface becomes covered with tubercles, which interfere with the discharge of sewage, and which may become in time extensive enough to cause obstructions in house drains.

It seems to me that the advantage lies entirely with Vitrified Pipe. This City has used it successfully for house drains for many years. Its use has given entire satisfaction when the work of laying it was properly done.

Yours very truly,
(Signed) Edwin J. Fort, Chief Engineer.

Write for Illustrated Literature and Competitive Prices:

Buckeye Fire Clay Co.	Uhrichsville, Ohio
Dennison Sewer Pipe Co	Dennison, Ohio
Evans Clay Mfg. Co.	Uhrichsville, Ohio
Kaul Clay Mfg. Co.	Toronto, Ohio
Robinson Clay Product Co.	Akron, Ohio
St. Marys Sewer Pipe Co.	St Marys, Pa

Use Vitrified Clay Pipe—It is the Cheapest and Best

This Advertisement Occupied Two Full Pages in a Prominent Trade Journal Published for the Plumbing Trade. It Shows That the Manufacturers of Vitrified Clay Pipe Believe in the Power of the Business Press to Reach the Real Users of Their Product

Clay Products Considered as Engineering Materials*

A Paper Presented at a Meeting of the International Engineering Congress, 1915, in San Francisco, Cal.

By A. V. Bleininger, B. Sc.

Bureau of Standards, U. S. Department of Commerce.

(*Continued from December 21 issue*)

THE NO. 2 FIRECLAY appears to show quite a regular increase in rigidity. The same relation in the case of the calcareous surface clay is almost linear and indicates that, when well prepared, this type of material possesses excellent structural properties. The other surface clay evidently possesses far lower rigidity. The highest moduli are shown by the shales, the lowest by one of the surface clays. These results are compiled in Table II.

Table II

No. of Sample	Kind of Clay	Burning Temperature, in cones	Modulus of Elasticity
32	“ “ “	5	4,330,000
32	No. 2 fire-clay	06	1,180,000
33	“ “ “	08	1,170,000
33	“ “ “	3	3,050,000
35	Shale	06	1,480,000
35	“	5	6,400,000
34	“	06	1,350,000
34	“	3	5,940,000
40	“	06	1,930,000
40	“	1	3,560,000
37	Surface clay (calcareous)	08	850,000
37	“ “ “	3	3,830,000
38	Surface clay (red burning)	06	376,000
38	“ “ “ “	5	2,240,000

The marked differences in the value of the modulus of elasticity in favor of paving-brick shales calls attention to the several proposals found in the literature concerning the application of a function of this factor as regards the toughness of the materials. According to Johnson "the area of the stress diagram up to the elastic limit, divided by the volume of the specimen under test is a measure of the ability of the material per unit volume, to absorb and give out energy or to resist repeated shocks without injury; and the total area of the stress diagram is to measure the ability to resist a single blow without rupture."

Shearing Strength

Results on shearing strength of brick are comparatively scarce. Some of the results obtained by J. E. Howard are compiled in the following table.†

Table III

Kind of Brick	% Absorption	Shearing Strength, lbs. per sq. in.	Crushing Strength, lbs. per sq. in.
Dark red	....	1,011	10,643
Light buff	19.00	642	8,144
Red	14.80	784	5,589
Dark red	....	714	6,814
Buff	....	1,767	13,292
Buff	11.6	1,097	15,374
Light chocolate	14.5	988	13,059
Gray	15.2	536	3,070

Hardness and Toughness

For building brick, the function of hardness is identical with good crushing strength and is usually determined, in a practical way, by the ring of the brick when knocked together, or by the cutting effect of a hardened-steel tool. The determination of the hardness by exact means is scarcely ever necessary, nor is toughness a quality specially looked for in building brick. The standardized sand blast test* affords a satisfactory measure of hardness where it seems desirable to emphasize this quality.

BRICK PIERS

Howard's Work

The subject of brick piers has been given considerable attention in this country by Mr. J. E. Howard, at the Watertown Arensal, and it was shown by him at an early stage of the work that the kind of mortar was an exceedingly important factor. The inherent great strength of brick can only be utilized by using a strong mortar. In ordinary brick masonry, therefore, even a fairly low-grade brick will possess ample strength. In places where strength is a real desideratum, cement or cement-lime mortar can be the only bonding material to be considered. Thus, Howard found columns, built of hard brick and from 6 to 10 feet high, to show, with 1:3 lime mortar, a modulus of elasticity from 250,000 to 750,000 and an ultimate strength

Table IV

Kind of Brick	Kind of Mortar	Age	Bond	Maximum Load	Load in Lbs. per sq. inch
Soft (C)	Lime	4 mos.	1:1:5	129,000	126
Hard (B)	“	“	1:1:5	892,000	990
Vitrified (A)	“	“	1:1:5	1,280,000	1,360
Soft (C)	“	“	1:1:2	182,000	178
Hard (B)	“	“	1:1:2	804,000	890
Vitrified (A)	“	“	1:1:2	1,197,500	1,270
Soft (C)	“	“	1:0:1	215,000	210
Hard (B)	“	“	1:0:1	764,000	840
Vitrified (A)	“	“	1:0:1	1,360,000	1,450
Hard (B)	Cement-Lime	1 mo.	1:1:5	1,545,800	1,760
Hard (B)	“ “	“	1:1:2	838,000	870
Hard (B)	“ “	“	1:0:1	1,594,000	1,760
Vitrified (A)	“ “	“	1:0:1	2,695,000	2,900
Soft (C)	Cement	1 mo.	1:1:5	660,000	650
Hard (B)	“	“	1:1:5	824,000	870
Vitrified (A)	“	“	1:1:5	2,697,000	2,900
Soft (C)	“	“	1:1:2	580,000	560
Hard (B)	“	“	1:1:2	1,834,000	2,070
Vitrified (A)	“	“	1:1:2	2,550,000	2,740
Soft (C)	“	“	1:0:1	524,000	510
Hard (B)	“	“	1:0:1	1,714,000	2,000
Vitrified (A)	“	“	1:0:1	2,520,000	2,710

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*By permission of the Director, Bureau of Standards.

†Watertown Arsenal Rpt., 1894, J. B. Johnson, Materials of Cons., p 662.

*A Comparison Between the Rattler Test and the Sandblast Test for Paving Bricks, Edw. Orton, Jr., Trans. Am. Cer. Soc., XIV, p. 180.

of from 750 to 1,300 pounds per square inch. The piers were invariably found to split longitudinally, indicating that the tensile strength of brick is a very significant quality and that, hence, the transverse test is an important factor. Using Portland cement mortar (1:2) the modulus of elasticity of the pier was raised to 3,000,000 and the ultimate strength to 2,500 pounds per square inch. Howard, at the Pittsburgh laboratory of the Bureau of Standards, also conducted tests of two very large brick columns, 4 feet square and 12 feet high, built with hard common brick from the Pittsburgh district. One was laid in 1:1 cement, the other in 1:3 lime mortar. The first showed an ultimate strength of 2,917 pounds; the second, 757 pounds per square inch. The total compression of the lime-mortar pier was chiefly permanent set, while the cement-mortar column at 1,000 pounds load was one-third permanent set and two-thirds elastic compression.

Recent Tests of Bureau of Standards

A considerable number of brick piers have recently been tested, at the Pittsburgh laboratory, by J. H. Griffith and J. G. Bragg*, in co-operation with the National Brick Manufacturers' Association. The size of the piers was about 30 x 30 inches, the height being 10 feet. Three kinds of brick were used: vitrified, hard and soft. Three kinds of mortars were, likewise, employed—cement-sand (1:3), 85% cement, 15% hydrated lime to 3 of sand and lime mortar, (1:6). Variations in bond were likewise made, viz., headers every other course, a header every fourth and every seventh course. All joints were made squeeze joints. The average thickness of the joints was 5/16 inch. The results of these tests are compiled in Table IV.

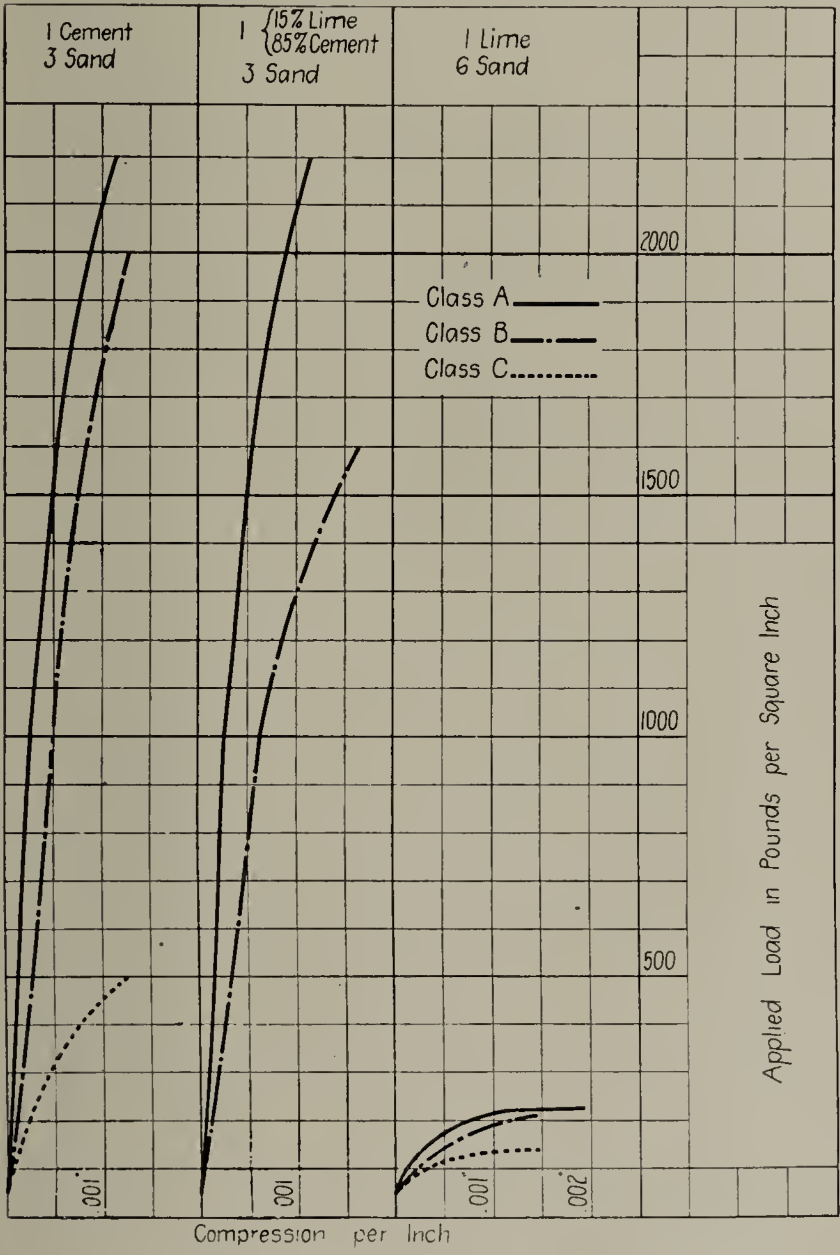

Fig. 4. Stress Strain Curves of Tests on Brick Piers. Bureau of Standards

Typical stress-strain curves of these piers are shown in the diagram of Fig. 4.

Conclusions From Pittsburgh Tests

From this work the authors draw the following conclusions: "The low strength of the lime mortars is attributed, in the main to insufficient ageing with a consequent lack of proper carbonation. The piers laid up with cement and cement lime mortar have about the same strength for any one grade of brick. The relative strength of piers built with vitrified, hard and soft brick laid in cement mortar is approximately in the ratio of 5:3:1. The work so far indicates that the strength of the pier is largely independent of the course bonding, the real function of the bond being, it is believed, to maintain a certain integrity and monolithic action of the masonry against initial strains induced through setting and drying out of the mortar. The slight increase of strength with the increase in distance between header courses is thought to be inconclusive. The mean moduli of the vitrified and hard brick laid in cement mortar were 3,000,000 and 2,500,000, respectively, the corresponding figures for piers in the lime and cement mortar being somewhat lower. The elastic limit is approximately one-half the maximum load.

"The piers fail through a tendency to separate into vertical laminae caused by transverse failure in the individual brick occurring from flexual action produced through unequal distribution of the vertical load over a cross section together with ineffective shearing and adhesive strength of the mortar. Uniformity in the brick dimensions is also a factor, to a lesser extent, in reducing unequal compression in the joints, as is the thickness of the joint itself.

"A high modulus of rupture is more desirable than superior crushing strength, as far as these be differentiated in their inter-relations. A high modulus of rupture would be realized in practice either by increasing the thickness of the brick or by laying them on edge so as to give their greatest flexual efficiency."

Porosity and Resistance to Weathering

Undoubtedly the most important quality of exposed structural stone products is their resistance to the weathering agencies, of which freezing and thawing are the most destructive. The properties which make certain materials weather resisting, while others succumb after a shorter or longer time, are not clearly understood. It is known, of course, that a vitrified brick, showing but little absorption, endures well, but when we are dealing with porous materials, the fact stands out that the one most absorbent, showing the greatest porosity, is not always the least resistant. Thus, porous bricks made by the soft-mud process may be decidedly superior in this respect to less porous bricks made by the stiff-mud process. It is evident that not only the volume of the pore space, but the mean diameter of the pores and their intercommunication are important factors. Bricks covered with an impervious coating, like a glaze or enamel, are subject to more severe stresses due to freezing and thawing than the same grade of material not so treated.

The only means of testing structural stone products as to their resistance to atmospheric agencies has been the freezing test. This test, while probably the best means of judging durability, is laborious and expensive, owing to the many repetitions. Other more indirect means of examination have been suggested, as for instance, the testing of specimens in the wet and dry state. Any decided lowering of the strength due to the saturation with water is supposed to be an index of the weather resistance.

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*Official Report, 29th Annual Convention, National Brick Mfrs. Assn., p. 102.

Accelerated tests have also been suggested as a substitute for the freezing test by making use of the volume change due to the crystallization of salts within the pores of the material. The most important method is Brard's process,* consisting in immersing the specimens in a boiling solution of sodium sulphate, Na_2SO_4. 10 H_2O, Glauber's salt, and exposing them to the air for a day in order that the salt may crystallize. This process is repeated. The solution of the decahydrate should be saturated when cold or at a temperature below 80° F. The loss in weight due to spalling may be computed. The average loss in weight by the sodium sulphate test is about six times that by the freezing test.† This test has also been used quite extensively by Prof. Bauschinger at the testing laboratory of the Royal Polytechnic School, Munich. This test was applied, in the Bureau of Standards laboratory at Pittsburgh, to three typical clays burned, in the shape of test pieces 4x4x2¾ inches, to different temperatures and subjected to four immersions (for 24 hours) in saturated sodium sulphate solution, followed each time by immediate drying at 110° C. Two series of specimens were prepared, one of which was fired to a somewhat higher kiln temperature than the other. The results were the same in each case and are compiled in Table V. From these data it will be observed that the test is sharp and decisive in breaking down the structure which has not reached its full strength. However, compared with the freezing test, it undoubtedly is too severe. It might be possible to modify it by using a lower concentration, say, a 10 per cent solution of sodium sulphate.

Table V

	Burning Temp.	Absorption per cent	Absorption per cent (check)	Remarks
Surface clay........	900	21.7	19.4	Cracked badly on 1st treatment.
Surface clay........	950	21.2	19.4	Failed on 2nd treatment.
Surface clay........	1,000	21.2	18.0	Cracks became prominent on 2nd treatment.
Surface clay........	1,050	19.1	14.8	Failed on 3rd.
Surface clay........	1,100	6.3	1.3	Not affected.
Surface clay........	1,150	0.6	Overburned	Not affected.
Shale	900	19.6	17.7	Many fire cracks after 1st treatment.
Shale	950	18.4	17.3	Failed on 2nd treatment.
Shale	1,000	14.2	12.0	Cracks increasing through 1st three treatments failed in 4th.
Shale	1,050	9.3	8.1	Not affected.
Shale	1,100	2.8	3.0	Not affected.
Shale	1,150	2.3	0.4	Not affected.
Shale	1,200	2.7	1.3	Not affected.
No. 2 fire clay......	900	15.8	15.3	Edges chipped after 1st treatment; failed on 2nd.
No. 2 fire clay......	950	15.0	15.1	Edges chipped after 2nd treatment.
No. 2 fire clay......	1,000	13.5	11.6	Failed on 3rd.
No. 2 fire clay......	1,050	10.5	9.6	Cracked badly on 4th treatment.
No. 2 fire clay......	1,100	8.2	8.3	Not affected.
No. 2 fire clay......	1,150	5.8	5.8	Not affected.
No. 2 fire clay......	1,200	3.5	3.0	Not affected.

Elaborate procedures, as outlined by Hirschwald* for the study of the weathering quality of stone are not readily applicable to clay products.

The remarkable resistance of well made clay brick to destruction by weathering is amply illustrated by the mediaeval brick architecture of Central Europe, not to mention the brick architecture of Babylonia and Assyria.

Resistance to Sudden Heating and Cooling.

In the large problem of fire protection, the resistance to sudden heating and cooling is an important factor. It is to be expected that clay products should stand up well under these conditions, having already gone through the ordeal of fire in their manufacture and, hence, containing no volatile constituents. Their resistance to such conditions must be considered a function of their porosity. The more porous the bricks, the better they should withstand sudden temperature changes. A certain degree of homogeneity, absence of larger lumps of foreign material, is also a necessary condition.

In large panel tests made at the Underwriters' Laboratories and reported by Mr. Richard L. Humphrey† it was found that bricks withstood the tests better than any other material. Lime knots seemed to be responsible for damage done to the brick. Dense vitrified bricks probably do not stand up so well under severe conditions as the more porous brick. Comparison with natural stones, in these fire tests, showed that bricks were superior to them. There is undoubtedly need for further work along these lines.

Actual fire experience seems to give undoubted proof of the excellent fire resisting qualities of clay brick.

With reference to clay building bricks as a structural material, it might be said that they undoubtedly afford one of the very safest products available, as usually their strength is ample for the purposes required and any inferior quality is at once detected by the most inexpert by simple inspection. Bricks have stood the test of time and are not likely to lose their importance as a building material in the future.

(*To be Continued*)

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*An. de Chem. et de Phys., Vol. 38, p. 160 (1828), later modified by d'Hericart and de Thury. Trans. Am. Soc. C. E., Vol. 33, p. 246.

†Trans. Am. Soc. C. E., Vol. 33, p. 253.

*Die Prüfung der natürlichen Bausteine auf ihre Wetterbeständigkeit, Berlin, 1908.

†U. S. Geological Survey, Bull. 370.

The Regular Departments—

"Superintendent", "Questions and Answers", Salesmanager" and "Letterbox" have been omitted from this issue.

They Will Be All the Stronger in the January 18 Issue

Brick-paved Station Platform at 63rd Street, Chicago, That Has Seen Fourteen Years of Service Without Repair.

Economy Dictates Brick-Paved Station Platforms

So Railroad Engineers Testify Regarding a a Comparatively New Use for Paving Brick

Auburn Park Station Platform on the Chicago, Rock Island & Pacific Railroad, at Chicago.

IN THE PAST DECADE the use of brick for paving railroad station platforms has become general thruout the United States. While the construction of this type of platform was introduced on some railroads long before 1905, its present popularity has been acquired largely since that time, until today there are thousands of vitrified brick platforms to be seen along the routes of travel. Low first cost, permanence, safety and little or no expense for maintenance, make this type of pavement an ideal one both for stations where there is heavy traffic and for those where the platform is not put to as severe a test.

A number of the railroads entering Chicago have used brick in the construction of many of their platforms, the Chicago, Rock Island and Pacific Railroad having made some particularly good records in the way of maintenance costs. At the Englewood Union Station, which is on the south side of the city at Sixty-third Street, a brick-built platform has been in service for very nearly fourteen years without a cent having been spent upon it for repairs. A view of this platform is shown in an accompanying illustration. It is now in the best of condition. At the Rock Island Station in Des Moines, Ia., a pavement similar to that at Englewood has been in service for fifteen years with about as good a record for repairs.

At Seventy-ninth and Wallace Streets, Chicago, about two miles south of the Englewood Station—where the grades of the Chicago, Rock Island and Pacific and the Chicago and Western Indiana Railroads have been separated in connection with track elevation work at that point—brick has been used for paving the Auburn Park platform at Seventy-eighth Street, a picture of which is also shown herewith. This platform is part of a very modern piece of engineering, where the grade is on a level with the surrounding housetops. The platform is wide, and besides being well-built, is attractive in appearance. Because of the fact that this platform has been in service less than a year, its maintenance figures are of little value.

There are so many advantages which can be placed to the credit of a brick-paved station platform that there is hardly any room for comparison with either wood or concrete. In first cost, brick is about equal to concrete, while a plank platform costs as much if not more than one paved with well burned brick.

As to comparisons in cost and convenience of maintenance, we find that when a portion of a brick platform settles or becomes broken, it can easily and quickly be replaced by section hands, no skilled labor being required for this work. On the other hand, when any part of a concrete platform becomes cracked or broken—as it often does—a whole square usually has to be torn up and then replaced, involving no small amount of expense in labor and materials. Men who are experienced in the handling of this class of work, must be employed, further adding to the cost. When a wooden platform needs attention, it is a job for the carpenter gang, which travels from its headquarters on the division, perhaps at a considerable distance from the site of the work, consuming valuable time which has to be charged in on the job. Besides, the carpenters' rate of pay is much higher than that for section laborers, making the repair of a plank platform a more expensive job than for one of brick.

Permanence is a much sought-after quality in railroad improvements. It is very often the deciding factor in the making of one installation or another. That brick forms a durable and lasting paving for platforms has already been demonstrated by service records such as those at Chicago and Des Moines. The life of a wood plank platform is three or four years at the most, decay quickly taking its toll, while the length of time a cement platform is in service is limited by the uncertainties of construction, particularly with regard to the original mixture of the concrete, and ever-recurring cracks.

The number of accidents that have occurred at depots because of slippery platforms should certainly warrant some investigation into paving materials, where this has not already been done. Wood, for years, has been the prevailing material for this purpose and because of its slipperiness in wet weather can be charged up with most of these accidents. While cement is not so blamable in this respect, it becomes very unsafe when covered with water which has been frozen by a sudden drop in temperature, its smooth surface making it very difficult for passengers to secure a good foothold without the aid of some gritty material under foot. The picture of the Auburn Park station platform was taken when just such conditions prevailed, and although sand had been sprinkled on its surface, as an added precaution, it is a fact and one which can be verified by a perusal of the photograph, that this platform would have been sufficiently safe without the sand, due to the roughness of its surface. It is also practically impossible for dangerous holes to develop suddenly in a brick-paved station platform, as is the case when wood is used.

On the New York Central Railroad thruout the state of New York a specially designed paving-brick with a figured pattern on the top is being used with the idea of giving the platform added roughness. The use of such a brick is not entirely necessary, as ordinary brick paving is sufficiently rough without it.

One of the best features of a brick platform is its attractiveness. The deep color of the brick lends a warmth to this part of the station that is not had with other materials. Furthermore, this color is lasting; no amount of traffic can dim its bright tints. The platform may become dirty or covered with litter, but this is easily swept away, leaving the platform as neat and clean as when first built. When an additional cleansing is desired, a hose may be turned upon the brick and its surface washed clean without the disagreeableness or danger that comes with a wet plank platform.

Another View of the Platform at the Englewood Union Depot, Chicago

The Chicago, Rock Island and Pacific Railroad Company has standard specifications which are used to cover the construction of its brick-paved platforms. Provision is made in these specifications covering the preparation of the sub-grade, the construction of the concrete curbing and for laying the brick.

In the preparation of the sub-grade, the area to be paved is first excavated and then filled with cinders usually, to a point three and one-half inches below the established grade of the finished paving. The filling must be placed in layers not over eight inches thick and each layer thoroly rolled with a steam roller weighing from seven to twelve tons. Where it is necessary to excavate considerable, no plowing is permitted below a point two inches above the sub-grade. Where no fill is used and the ground is wet, a coat of sand or macadam is laid before the use of a roller is being rolled. Where the use of a roller is impractical, it is provided that the surface of the sub-grade be thoroly wet and rammed until compact. Should any soft or spongy material be detected, it is removed and replaced with suitable material and then thoroly rolled and tamped.

In building the concrete curbing along the exterior edges of the paving, sections approximately twelve feet long are constructed. The curbing is formed by mixing one part of Portland cement, two parts of sharp, coarse, clean sand and four parts of crushed stone, such as will pass thru a three-quarter inch mesh and not thru a one-quarter inch mesh. In place of the stone, good, sound, washed and screened gravel of the same size may be used. The front edge of the curbing is rounded off, while that facing the brick is constructed with a straight, smooth edge. The exposed surface of the curbing is made by using one part of Portland cement and one part of sand, which mixture is troweled to a smooth, even surface.

When the curbing has been completed, a sand cushion one and one-half inches in thickness is spread over the sub-grade, so that when rolled, it will have a thickness of one inch. The Chicago, Rock Island and Pacific Railroad Company lays its platforms with the brick set flatways, a saving in the number of brick required being thus effected, amounting to 33⅓ per cent, thus making the cost of this type of platform cheaper than it might otherwise be—an added incentive to the construction of more brick platforms and, incidentally, the use of more paving-brick.

After the brick are laid, the pavement is swept clean and closely inspected, all defective brick being replaced with perfect ones. The pavement is rolled with a five-ton roller, the brick next to the curb and around fixtures in the pavement being tamped with a hard wood tamper to the proper grade. The finished work is then covered with a thin layer of sand, which is swept so as to fill all spaces between the brick.

The cost of laying brick-paved station platforms, according to the architect of the railroad named, is thirteen cents per square foot, including the preparation of the sub-grade, while from thirty to fifty cents a foot is required to build the concrete curbing.

The Chicago and Western Indiana Railroad Company has used brick for the paving of its walks between tracks in its Fifty-first Street coach yard, Chicago. These brick walks were installed with a view toward permanence and attractive appearance. They are also very safe, as much switching is done in these yards where a good footing is a big help to the switchmen.

Counting the Cost

Being the Text of a Booklet Issued by an Arkansas Brickmaker

By N. P. O'Neal

A Brick House that Was Built at a Cost Exceeding the Lowest Frame Bid by Only $124.70

Mankind has always wanted a home. From the earliest times to the present he has constantly wanted a better home and has wrought wonderful improvement in home building.

Starting out with a hole dug in the side of a hill, or a natural cave in the mountains, all the way down the line we find improvement, and today we find the palatial residence built of brick and timbers, designed for beauty, comfort and utility.

The very first thing any man does when going to build a home is to sit down and count the cost; this is good hard sense, backed by scripture.

The average man builds two homes in a life time in America, and it is well to do it right; if done right the first time most of the second time efforts would not be necessary. Sometimes we find men who have built more than two homes and usually the last one is a good one, the tendency being to cut out mistakes made in other homes and the result is a better home than the average.

Many men going to build think that brick is beyond their reach, while as a fact it may not be beyond their reach at all.

Lumber has always been so cheap in Arkansas that every one just naturally concludes that a frame house is very much cheaper than brick and when taxed with the argument that it decays rapidly, replies that it will last longer than his life time. Often, however, it does not do it.

Then, too, the money question is easily settled because bankers as a rule will loan money more readily on a brick house because it does not depreciate in value.

Now the only way any man can decide for himself the kind of home he will have is by comparison; many people live in tents, costing but little, in log houses costing but little more, and which, though crude, are often quite comfortable, while others build with sawed lumber and dressed lumber, brick, stone and cement, but it is a safe statement that all count the cost and make the comparison.

In this booklet will be made a comparison of what we all know as first-class frame houses and brick houses; these vary largely in cost, just to the extent of the desires and the ability of the owner to stand the outlay. Frame houses vary just as much as brick but not more so and we do not intend to tell you the first cost of a brick house is no more than the cost of a frame house, but we do intend to tell you the truth and let you decide which you will have when you build.

What then is the best way to make the comparison, since forms of construction vary and the costs vary even when the same form of construction is used by different people?

Would it be accurate to get the contractors to figure the plans for both frame and brick?

Such a proceeding is sometimes followed but very few people do it that way. The architects cannot make plans for the two houses without a lot of extra labor; it is proposed here to place the matter on such a simple basis that a ten-year-old boy can figure out the difference in the cost of a house when built of frame or brick if he knows the cost of either one for that particular design.

The very first consideration is that both must be finished up exactly alike. By this is meant all the interior finishings, doors, windows, cornice, etc. Right here, however, is the point of argument and really the crux of the whole matter. A splendid architect recently said to the writer: "When you begin to talk brick house, there are a thousand and one things entering into it that run up the cost." Now if the reader will just stop and analyze that statement he will quickly see why the first consideration is to be that both houses be finished alike. The point is that when you mention a brick house to a man he begins to think of quarter-sawed oak floors and inside trim, mahogany doors and porcelain bath room outfits with silver trimmings and all other fittings to match. The walls are the only part in which brick are used so why charge up to a brick house all the extras that seem to go to harmonize with it?

We have to consider the foundation next because it is the life of the building. A frame house being lighter does not require so much foundation. The walls of a brick house weigh approximately five times as much as a frame, but it must be understood that the floors, ceilings and roofs are the same in both houses we are comparing and as these must be carried on the walls it brings the ratio down to between forty and fifty per cent more weight per square foot of foundation for the brick house.

In starting a first-class frame house, however, the walls up to the sill line are usually the same as for a brick house up to the same line, except the footings under the walls must be wider and thicker for the brick house to carry the additional weight. Since then we have the same walls to sill line, and have the same floors, ceilings and roof in both houses it comes down to a point of getting the difference in the walls only and adding to that the extra cost of the foundation for the brick house.

Now to get the matter so anyone can figure the difference all we will have to do is to figure up a square yard of wall surface of each house, find the number of square yards in the house and get the result, and so determine, for ourselves, just what kind of a house we will build. A wise man will hardly "build to burn" when a few dollars more will give him a brick house, not likely to burn.

A good frame house consists of the following material for the walls. Beginning at the outside we first have:

Three coats of paint; one thickness of siding; one thickness of insulating paper; one of storm sheathing; studding; lath; plaster.

As the plaster is to go also on the brick walls and both being alike we will leave the cost of that item off.

Three coats of paint cost per square yard applied	$0.27
Siding at $20 per M board measure, allow for dressing, laps	.34
Insulating paper, applied	.04½
No. 2 storm sheathing	.24¼
Studding @ $16 per M, allow for bridging, plates, etc.	.20½
Lath, applied	.08¾
One pound of nails to apply to all of the above	.02½
Total cost per square yard of a frame house above sill line	$1.21½

For a brick veneer we only have to leave off the painting, siding, and paper and add on the brick and wall ties:

Leaving off above items leaves us with	$0.54¾
57 "select" brick are required per yd. @ $10 per M	.57
10 wall ties, applied	.09
Mortar	.12¾
Bricklayers and laborers @ $7.75 per M brick	.44¼
Total cost per square yard for brick veneer	$1.77¾

FOR 9-INCH SOLID BRICK WALLS:

57 "select" brick	$0.57
57 backing brick	.45½
Mortar to lay them	.25½
Bricklayers and laborers @ $6.25 per M brick	.74¼
50% more foundation, costs approximately	.22
Total cost per square yard of 9-inch walls	$2.24¼

FOR 13-INCH WALLS:

57 "select" brick	$0.57
114 backing brick	.91
Mortar	.36¼
60% increase in foundation over veneer	.26½
Bricklayers and laborers @ $6.08 per M brick	1.04¼
Total cost per square yard of 13-inch walls	$3.17
Brick veneer costs more than frame above sill line, per yard	$0.56¼
9-inch wall costs more than brick veneer, yard	.46½
13-inch wall costs more than 9-inch wall, yard	.92¾

To the 9-inch wall house add $15 for anchors and bolts, and for extra on frames because boxed all round, $1.50 per opening, about $27. Brick sills are now largely used for brick houses.

For the 13-inch wall both the above items must be added and also 4-inch of brickwork from the foundation to the sill line which costs 88c per square yard.

If mortar color is used it will cost between $1.50 and $2.00 per M. brick laid with it but of course color is optional with the owner, and the color selected causes the difference in price as above, some costing more than others.

Now if we take for example a 7-room residence with pantry and bath with rooms averaging 15x15 ft., except the pantry and bath we usually have a building that measures around the outside walls, approximately 240 feet, or 80 yards. If the story is 11 ft. and we add 1 ft. for first joist we have the walls 4 yards high by 80 yards around, making a total of 320 square yards, to which we will add 3 gables of 10 yards each and we have a total of 350 square yards of wall surface above the sill line for a good roomy 7-room house. Smaller houses have less, larger ones more.

350 yards of frame house walls, @ $1.21½ per yard	$ 425.25
350 yards of brick veneer walls, @ $1.77¾ per yard	620.70
350 yards of 9-inch brick walls, @ $2.24¼ per yard	784.87
350 yards of 13-inch brick walls, @ $3.17 per yard	1,109.50

And to the 9-inch wall the amount must be added for frames and anchors $42.00

To the 13-inch wall we also add 4-inch of brick work below the sill line $101.00

Making these last two cost $826.87 and $1,210.50, respectively. So we find the veneered building costs only $195.45 more than frame, the 9-inch solid brick costs only $401.62 more than frame and $206.17 more than brick veneer; while a 13-inch wall house costs $785.25 more than frame and $589.55 more than brick veneer and $229.92 more than 9-inch walls. All the interior walls are alike in each house and are usually stud walls with lath and plaster. To cover with cloth or paper is a pure waste of money. It costs more per square yard in the first place and is not nearly so durable or sanitary as the standard wall plaster.

Objection is made that brick walls are damp. This is entirely overcome by building hollow walls, either 9-inch thick or 13-inch thick, and makes just as strong a job when properly bonded with brick or metal ties as tho it were solid. If bonded with brick they should be Flemish bond every fifth course in height. Sometimes brick walls are furred and then lathed and plastered. When this is done 2x4 studding is nailed to the brickwork flatwise and lathed on that. This procedure costs 25 cents per square yard but is not at all necessary.

These figures apply to buildings in Arkansas where the author is familiar with conditions and prices and knows what houses cost. You will take particular notice of the price of materials in each kind, only medium price stuff being figured. More expensive material will make the house cost more. It also demands better, closer workmanship. You can have your home contractor verify these figures; just ask him to carefully figure up the cost per square yard of wall surface without telling him what you want, any more than that it must be carefully done. You will get approximately these figures.

Don't tell him to tell you the difference between brick and frame for he will only guess at it and you know what guesswork is. It is always better to build permanent homes, they sell better if you wish to sell. "It is better to be safe than sorry." Brick houses do not burn.

Machinery and Equipment

In This Department We Give Descriptions of Such Machinery and Accessories as Our Advertisers Have to Offer, or Make Such Announcements as Are of Interest to Our Readers

AN ELECTRIC LOCOMOTIVE that has two new and ingenious features is manufactured by The Morgan-Gardner Electric Company, of Chicago.

The operating radius is not confined to the distance the trolley wire is hung. By glancing at the cuts shown in the Morgan ad, it will be noticed that at each end of the locomotive are reels. One reel contains 350 feet of insulated cable. This reel automatically plays out or takes in this cable that is supplying current to the locomotive. It is used, if for any reason it is desirable, to run the locomotive beyond the end of the trolley line, or on a side switch.

The other reel contains 500 feet of steel cable, it is motor-driven and is used to gather in the loaded cars beyond the trolley line or from side tracks where the heavier locomotive cannot travel.

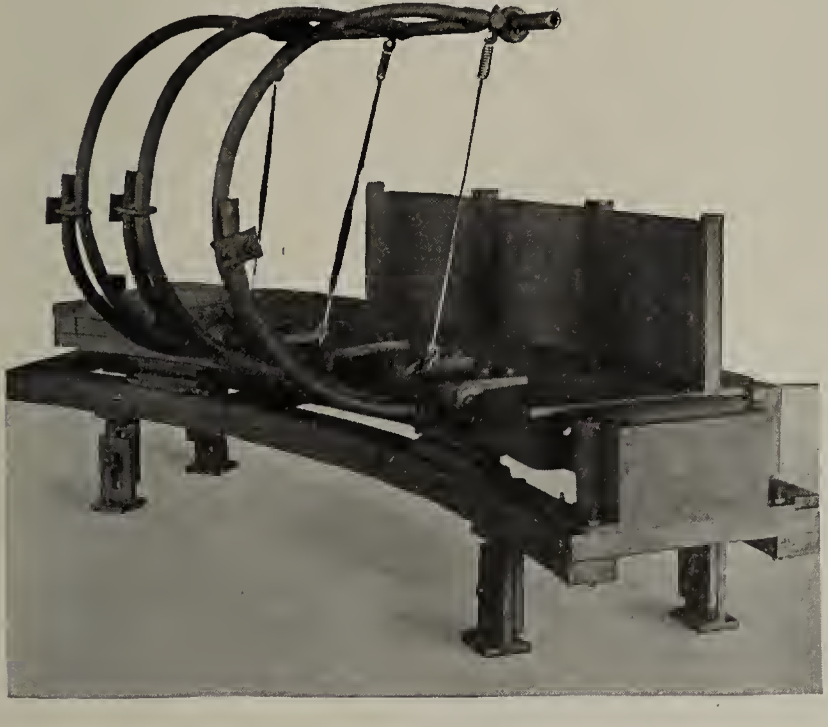
Used in conjuction, the reel and gathering crab enable the operator to gather cars 850 feet in advance of the closest trolley wire connection.

In working along the face of pits and in mines these features have been found invaluable, for it permits of a very elastic haulage system, permits of permanent locomotive and main line track, to be fed by temporary stub track to the working face.

Catalog No. 57 is on "Clay Haulage and Locomotives." Write for your copy, addressing the Morgan-Gardner Electric Company, Chicago.

A Silo Block Cutter

A machine for cutting silo blocks has long been desirable. The crude and cumbersome methods that were tolerated when production was small, are to expensive for today and the task of cutting radial silo block in large quantities has been both difficult and expensive.



Crawford & McCrimmon Silo Block Cutter

Crawford & McCrimmon of Brazil, Indiana, have perfected a one-man radial silo block cutter that has solved the problem.

The table is well built with an all-iron frame and by its use the cost of cutting radial clay silo blocks has been materially reduced. It sells for the very moderate price of $175 on cars, at Brazil, Ind.

Crawford & McCrimmon have had forty-seven years of successful manufacturing experience and their new shops are well equipped to turn out perfect machinery.

Pettigrew Stove

Heating Stoves

There are many cold and uncomfortable places in clay-plant buildings that should be made warm and comfortable by installing a big cast metal stove.

Particularly is a good heater appreciated in the clay storage and grinding rooms and in boiler and machine rooms.

The Pettigrew Foundry Company, of Harvey, Ill., specializes in this and all other classes of founders' work, and is prepared to make any kind of castings, grate bars, car and wheelbarrow-wheels, etc. They also have a line of high-grade drier cars, made with the utmost care and of the best material.

Not Accepting War Orders

Adhering staunchly to a definite policy of service at home, the Buckeye Rolling Mill Company, of Steubenville, Ohio, has consistently refused to book attractive war orders at any of its plants.

It has been, and still is, the belief of the Buckeye officers that the entire energies of their plants should be at the service of new and old domestic customers.

That this far-sighted policy is being appreciated, is attested to by busy mills. The clay-products men want first quality rails and service and they are placing their orders where they can get both—with the Buckeye Rolling Mill Company.

A Real Wheelbarrow

Wheeling is the hardest, least wanted job on the brick plant. The chief cause of its lack of popularity among laborers is the use of a poorly designed wheelbarrow, in which the wheel is placed under the front end of the barrow instead of directly under the load. The wheeler is forced to share half of the load with that improperly placed wheel, and in addition, he must guide the wheel and balance the loaded barrow.

Note the Toronto buggy—the wheel is placed slightly

BRICKMAKERS' HEADQUARTERS
FOR GREASES AND OILS
A special brand for each requirement of every kind and size of machine. Also Belt Dressing and Boiler Compounds. Write for catalogue and prices.
G. B. STOCK XYLITE GREASE & OIL CO., Port Huron, Mich., U. S. A.

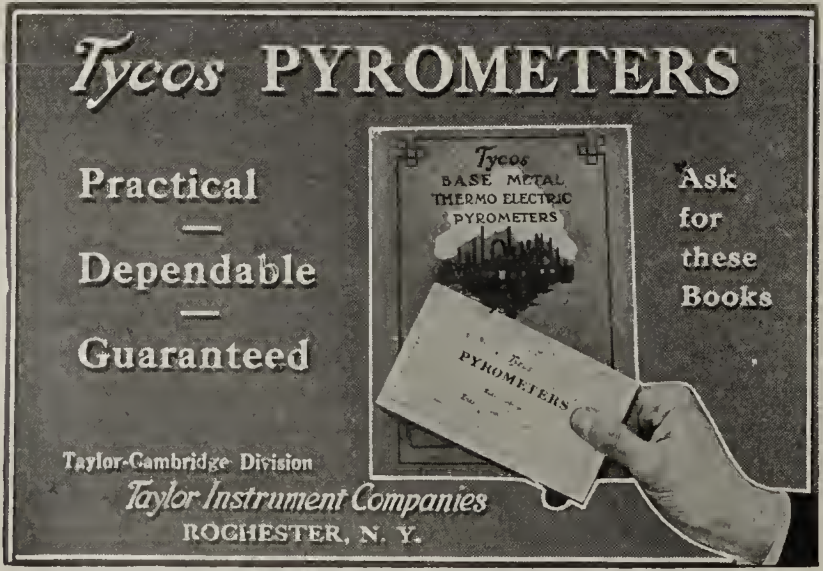
Anchor Brand Colors
For Mortar Cement and Brick
Brown, Black, Red and Buff Strongest and most durable
Manufactured by
C. K. WILLIAMS & CO., EASTON, PA., U. S. A.
Correspondence solicited

G & S PRECIPITATED CARBONATE OF BARYTES
We are now able to ship promptly from our new factory in New Jersey. The war no longer troubles us.
WRITE FOR CIRCULARS AND PRICES.
GABRIEL & SCHALL, 205 Pearl St., New York

FREEFLOW METAL
A babbitt metal especially adapted for brick plant use. — Write for prices.
H. W. GERLOCK Huntingdon, Pa.

Watchman's Clocks
Approved Systems from $10.00 up
NEWMAN CLOCK COMPANY
181 Fulton St., New York 564 W. Washington Blvd., Chicago

Ricketson's Mortar Colors
Pure, brilliant in tone, economical in use, absolutely reliable and a permanent guarantee against fading and washing. Why not insist on having them?
Red, Brown, Buff, Purple and Black
Ricketson Mineral Paint Works, Milwaukee, Wis.


Tycos PYROMETERS
Practical
—
Dependable
—
Guaranteed
Ask for these Books
Taylor-Cambridge Division
Taylor Instrument Companies
ROCHESTER, N. Y.

in front of the center of gravity of the barrow and load when the handles are raised. The result is that the wheeler bears only enough of the load to steady his hands and make balancing and guiding easy.

The runners, too, are curved, and do not catch on obstructions; they slide.

The bearing is babbitted with Nugget bearing metal. It is a designed barrow, not just a "made" barrow, and if you want wheeling results from satisfied, hustling wheelers, a fleet of Invincibles, made only by The Toronto Foundry & Machine Company, Toronto, Ohio, will help you toward this end.

Recipients of Holiday Greetings

Our advertisers have mailed to the trade this holiday season a greater variety of handsome cards and calendars, and useful gifts, than we have ever before had occasion to see. Naturally "Brick and Clay Record" is delighted to have been favored in this connection and it gives us pleasure to thus publicly acknowledge our gratitude.

E. M. Freese & Company send a calendar that's different, done in black and white. E. I. du Pont de Nemours & Company send a beautiful necktie and a New Year's card. Roessler & Hasslacher Chemical Company, a calendar. The Thwing Instrument Company, a blotting stone. The Cling Surface Company, a folding calendar, showing tight and loose belts before and after using Cling Surface Belt Dressing. The Weller Manufacturing Company again put up a memo pad to fit the brass stand sent out a year ago. Cards expressing the holiday spirit came from: R. G. Smith, Kansas City, agent of the Bonnot Company; J. W. Hensley, Indianapolis, Ind.; The Lehigh Portland Cement Company; the Dunn Wire-Cut Lug Brick Company; R. R. Shuman, and The Ad. Art Studios.

Did You Get Your "Nugget"?

"Nugget" Babbitt has so established itself among clay-products manufacturers that it is undoubtedly being used to a much greater extent than any other babbitt made.

"Nugget" has established itself because it is scientifically manufactured for the special requirements of clayworking machinery.

Before "Nugget" was placed on the market, a very careful canvass was made of the needs of brickmakers, and the formula that is used in making "Nugget" was the result.

Many brickmakers in various sections of the country have been writing to The Cleveland Alloys Company of Cleveland, Ohio, telling them of the splendid results they have had from the use of this babbitt metal.

One of the largest clayworking concerns in Ohio recently said:

"We have been using 'Nugget' Babbitt Metal for some time and would positively consider no other brand of Babbitt as long as we can get 'Nugget' at the right price. Our experience has been that it will out-wear any other brand we ever had by three to one—that is, it lasts three times as long in bearings on heavy machinery. We always stand ready to boost 'Nugget' Metal and will do so as long at it maintains the same high standard as it has now."

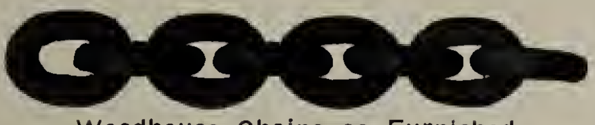
The Cleveland Alloys Company will be glad to prove to clayworkers in any section of the country that "Nugget" is the babbitt for them.

Six Mammoth Chains

The Woodhouse Chain Works of Trenton, N. J., has made for the United States Government six large chains to be used to anchor dredges at the Panama Canal.

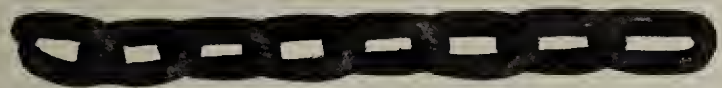
Two of these chains were 900 ft. and four were 700 ft. in length, all made from 1¾-in. stock with links 5½ in. long.

The Government Inspector's test is very severe, in which he cuts at random three links from each 150 ft., rewelds and tests to 172,000 pounds tensile strain per square inch. If the test is satisfactory the chains are rewelded and the whole chain is tested to 122,000 pounds tensile strain per sq. in.



Woodhouse Chains as Furnished

This interesting test is cited to show that Woodhouse chains are fabricated from such a high grade of metal and in such a workmanlike manner that they meet the approval of the most exacting buyer in the U. S. A.—our Uncle Sam.



The Same Links After Sixteen Months of Continuous Service in Heavy Dredging

The same stock, the same care is taken in the manufacture of chains for steam shovels, and so it is not particularly remarkable that all Woodhouse chains "stand up" under the hard shale-pit work.

Have you made arrangements to equip your shovel with Woodhouse chains?

Just Valves

Did you ever figure your losses from leaks thru worn-out, poorly designed valves? Do you know that thru a leak one-quarter of an inch in diameter, with steam at 120 pounds pressure, your losses amount to $121.15 per month; and thru a leak one-sixteenth of an inch in diameter your losses approximate $7.47 per month? These losses are figured with coal of 13,000 B. t. u. at $2.00 per short ton, and water at 10 cents per 1,000 gallons.

It seems unbelievable, but nevertheless it is true, and illustrates better than in any other manner the value you get when you equip with Homestead valves.

Try them as stop valves on feed water lines, high and low pressure steam lines; everywhere—a Homestead gives satisfactory service.

The Hovalco—a blow-off valve, is positively unexcelled, so its manufacturers claim. It must give long, safe and efficient service, and is so guaranteed.

Send for catalog and the table showing steam losses thru leaks, at all pressures. It means profit and satisfaction to you. Manufactured only by The Homestead Valve Manufacturing Company, of Homestead, Pa.

No More Belt Joint Trouble

The Crescent Belt Fastener Company at 381 Fourth Ave., New York City, have a method of joining the ends of belts that makes the joint last longer than the belt itself. Write them for information and they will explain. They guarantee not to weaken the belt.

The Cling-Surface Company of Buffalo, N. Y., has issued a special calendar of interest to belt users, and as long as the supply lasts will gladly send a copy to any belt user who applies for one.

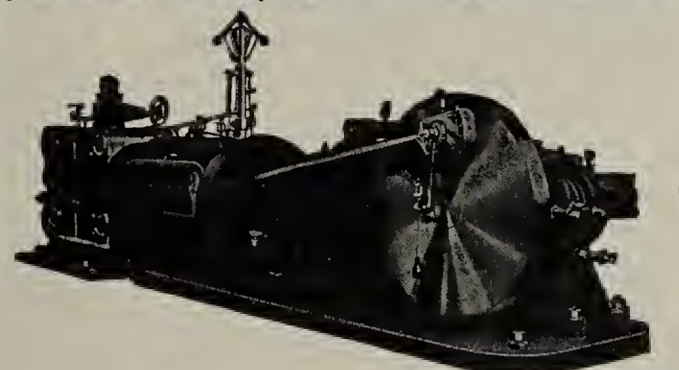
CRESCENT
BELT FASTENERS
ARE LOW IN FIRST COST AND MAKE A JOINT WHICH LASTS LONGER THAN THE BELT ITSELF, THUS EFFECTING A SAVING IN BELT EXPENSE.
Send for Booklets
CRESCENT BELT FASTENER CO.
381 FOURTH AVE., NEW YORK, U. S. A.
ECONOMY

The Cincinnati Frog & Switch Company
[illegible] OF
TRACK EQUIPMENT FOR
STEAM AND ELECTRIC RAILROADS.
MINES AND MILLS.
CINCINNATI, O.

Any Kind of Track Equipment, Standard or Special. Shipped the Day You Want It

Catalog C Pictures It All—Copy Sent on Request

POWER PLANTS COMPLETE
CORLISS ENGINES, WATER-TUBE AND TUBULAR BOILERS



Send for Catalogue No. 65-B
Murray Iron Works Co. Incorporated Feb. 1, 1870 BURLINGTON, IOWA

"Buckeye Rails Are the Standard for Quality"
THE BUCKEYE ROLLING MILL COMPANY
Exclusively Manufacturers of First Quality Light Steel Rails and Accessories
Offices: Steubenville, Ohio
Mills: Newark, Ohio
BUCKEYE MEANS BEST
BEST MEANS BUCKEYE
All Sections from 12 lb. to 40 lb. per yard
Write or wire us when in need
No order too large to handle promptly or too small to receive immediate attention

Pyrometer Permanence

You have frequently heard of other pyrometers being displaced by the STUPAKOFF LE CHATELIER, but you have never heard of the Stupakoff Le Chatelier being replaced by any other make.

Write for a copy of "Pyrometer Facts."

The Stupakoff Laboratories
Pittsburgh, Pa.

ORDER YOUR CUTTING WIRES FROM WEBB

They cut every kind and class of wet clay ware. Face, common and paving brick. Sewer pipe, tile conduit and fireproofing.

STRENGTH UNIFORMITY DURABILITY
REG. U.S. PAT. OFF.

They screen clay, shales and grog. Webb Wires are small and tough, cut clean and leave no ragged edges. They don't break.

THE WEBB WIRE WORKS, New Brunswick, N. J.

With your Shovel ?
In a hurry ? Must have clay ?
The Beam swings and drops,
Rips and rams
For dipper load—
Swings back—then dumps—
and the chains—"They will not break"
if they're WOODHOUSE SPECIALS
We'll tell you why.
WOODHOUSE CHAIN WORKS Trenton, N. J.

PERFORATED METAL SCREENS

As required for BRICK MAKERS USES.

PERFORATED SHEET METALS OF EVERY DESCRIPTION
HENDRICK MANUFACTURING CO.
CARBONDALE, PENNA.

New York Office
Room 1028 Cortlandt Building

Manufactured by
HENDRICK MFG. CO.
CARBONDALE, PA.

In the Wake of the News

Being Brief Mention of a Host of Interesting Happenings in the Varied Fields of Clayworking

PERSONAL

Archie Reid, of Newark, N. J., newly elected president of the Face Brick Dealers' Association of America, has reorganized his Philadelphia business, making it a stock company. The concern will hereafter be known as A. S. Reid & Company, Inc., and offices will be maintained in the Morris Building, as heretofore. The officers of the new company are A. S. Reid, president; James T. Reid, vice-president; James Tongue, treasurer, and W. H. Gaul, secretary.

Dan Raymond, manager of the Garden City Pottery Company, San Francisco, which handles a large part of the flower-pot business with the nurseries of that section, has left for the East, intending to visit a number of the leading flower-pot factories there to learn what improvements have been made, if any.

Charles E. Roberts, formerly of Indianapolis, Ind., has formed the Roberts Supply Company, in Lima, Ohio, to handle brick and other building materials.

Matt. L. King, secretary of the Permanent Buildings Society, Des Moines, Ia., was a recent visitor to Chicago, being in that city to attend the annual meeting of the American Society of Agricultural Engineers, at the Hotel Sherman.

C. J. Craycroft, president and principal owner of the Craycroft-Herrold Brick Company, Fresno, Cal., died on November 17 due to injuries received in a fall from the roof of a two-story building where he was believed to have been overcome from a heart attack.

Charles F. Clippert, Detroit brick manufacturer, has been elected president of fire commission of that city, for the new year. He was chosen at the annual meeting held December 27, 1915. Looks like a good place for a brickmaker.

John F. Sanford of Portsmouth, N. H., who has been connected with the York Harbor Brick Company of York, Me., as a stockholder for many years, has been named as treasurer of the company to succeed Arthur Locke, of Portsmouth.

Alfred Thibeault, formerly manager of the New England Brick Company's plant, at Gonic, N. H., has taken over the management of the Bradford Inn, a local hotel.

H. H. Bartells, formerly with the Streator (Ill.) Brick Company, has accepted a position with the Bessemer Limestone Company, of Youngstown, Ohio.

F. R. Carter, of Peoria, Ill., has just put in a new stone crusher. He reports business as being "fair" with signs of improvement.

T. N. McVey has joined the sales force of the Streator (Ill.) Brick Company.

ALABAMA

A new mine of rich clay has been opened up on the property of the Kahn Brick Company, Selma, Ala., according to Gordon Ames, superintendent. The company has also installed a new locomotive and a string of four dump cars in place of the one and one-half yard cars and mules formerly used. An eighty-five foot brick stack is being built at the power plant to take the place of a sixty-five foot steel stack. New boiler settings of a special design have also been installed recently thru which the company expects to save ten dollars a day in fuel. The quality of the Kahn Company's product is being raised by a better system of pugging and preparation of the raw clay for the machine. A system of sorting the brick as it comes from the kiln is being followed, with the result that five different shades are obtained, which bring higher prices than the unsorted brick. It is the intention of the company, just as soon as it can get the plant working systematically, to begin the manufacture of silo blocks.

ARKANSAS

The Hope (Ark.) Brick Works reports a good business for the past four months, and thinks that the existing demand will continue for some time to come. The company is about to commence the construction of a new continuous kiln at its plant, which will cost in the neighborhood of $30,000. Drain-tile is a new addition to the company's line of ware. The fact is being demonstrated locally by the sales department that a brick house costs so little more than frame, that it is only a question of a few years before homes of wood will be the exception—rather than the rule—in Arkansas.

CALIFORNIA

J. R. Gwynn, manager of N. Clark and Sons, San Francisco, has just returned from southern California, where he has been figuring on some terra-cotta work. This company's sewer-pipe department is busy.

The California Paving Brick Company, San Francisco, has moved its city office to the Chronicle building. Mr. Pritchard, the general manager, however, retains his headquarters at the plant.

Reviewing the situation on the Pacific Coast for the past year, W. W. Dennis, of the McNear Brick Agency, San Francisco, says: "The brick industry in the Central California district, to which the manufacturers of San Francisco Bay look for a market, has closed a very fair year, considering the unparalleled conditions existing during the early part of the season to which the trade was compelled to adjust itself.

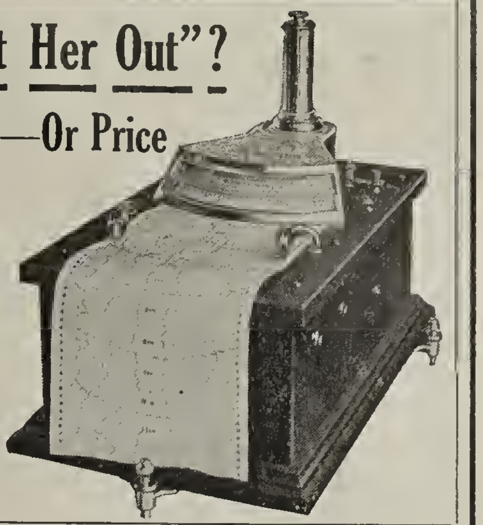
"San Francisco and Oakland, the largest cities on the Coast, show a greater decrease in building operations than other sections. This was caused largely by the apartment house construction having been rushed to completion before the beginning of the Exposition. Most of the work now under way in these cities is composed of municipal and state construction, with a considerable number of warehouse and factory buildings of large size going up.

"The factory district on the east shore of San Francisco Bay has been more active than for years. The ex-

"When Do You Put Her Out"?
Guess At It—Time Limit—Or Price

Do you know positively when your kiln has reached and sustained for a sufficient length of time—a maturing temperature?
A Price Pyrometer furnishes absolute information.

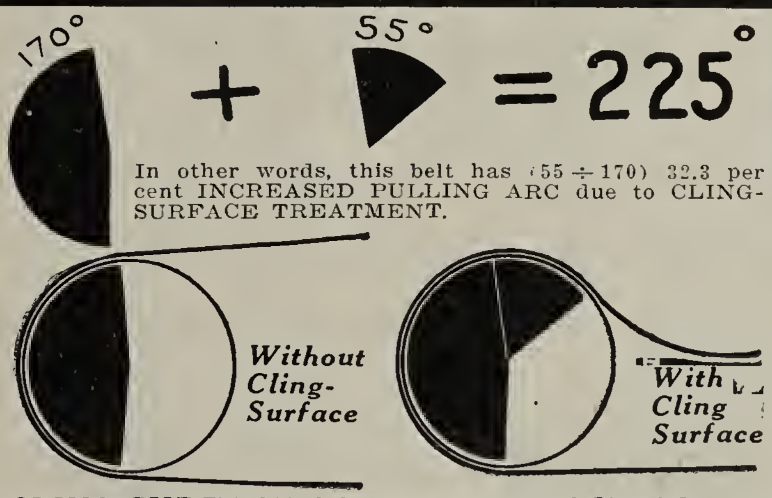
The Price Electric Co.
12367 Euclid Ave.
Cleveland, Ohio



Your Fire Insurance Rate Is Too High
—we know this without asking you because you will get a reduction if you install the
HardingeWatchman's Clock

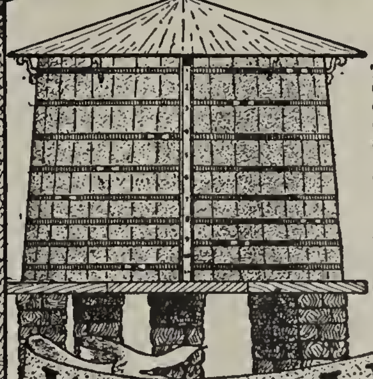
It certainly is to your interest to let us talk this over with you—we will prove our claims.
Approved by National Board of Fire Underwriters.

Hardinge Bros., Inc.
1760 Berteau Ave., Chicago, U.S.A.



In other words, this belt has (55 ÷ 170) 32.3 per cent INCREASED PULLING ARC due to CLING-SURFACE TREATMENT.

CLING-SURFACE CO 1029 Niagara St Buffalo N Y



"The Tanks with a Reputation"
The unequalled serviceability of the CALDWELL CYPRESS TANK is because of its unequalled quality of materials and construction. We use only the "everlasting" cypress from the Louisiana swamps, that outwears and outlasts every other kind of tank wood, being practically as durable as steel. These tanks are hooped with such care and precision as to be absolutely tight, not for a season but for an indefinite number of years. Caldwell construction makes leaking impossible, and repairs unnecessary. Investigate the Caldwell tank and you will take no other. Ask for illustrated catalogue.

W. E. CALDWELL CO.
(Incorporated)
LOUISVILLE, KY.
TRADE PAPER ADV. AGENCY, N.Y. NO 591

SAY!

Are you using ***Nugget Babbit?***

WELL — WHY NOT? —

It's the best—its hardness insures great wear resistance—it stands up under heavy duty—over one hundred other plants stock it—and use it.

What's your address?

THE CLEVELAND ALLOYS CO.
CLEVELAND - - - - - OHIO

Drier Doors That Hold the Heat
No matter what type drier you have, you need to equip it with the

"Carrier" with One Door Lifted.

Perfected Dry Kiln Door Carrier

Doors can't warp or get out of shape—easy to operate—only one carrier needed for each battery of doors.

Made for doors from 2' to 8' wide and 5' to 8' high. Made for wood or fireproof construction.

Write for catalog B2 and all details.

Sold on 60-day trial.

Dry Kiln Door Carrier Co.
Indianapolis, Indiana

THE IMPORTANCE OF DRAFT CONTROL IN BURNING

Cannot be overestimated. For many years we have made the

Best Draft Gages for Kilns.

The Ceramic Supply & Construction Co.
COLUMBUS - - OHIO

Increase the Sale of your Output

Our booklet, "HINTS ON FARM DRAINAGE", if distributed among the farmers in your vicinity will convince them of the practicability of using drain tile. Send for sample copy. :: :: ::

BRICK AND CLAY RECORD, Chicago

tension and enlargement of powder, sugar, chemical and petroleum plants play an important part in the increase."

CONNECTICUT

The Park Brick Company of West Hartford, Conn., is building a garage to house its automobiles.

GEORGIA

A petition for the incorporation of the Savannah (Ga.) Kaolin Company to be capitalized at $500,000, has been filed. The company will engage in the mining and marketing of clays and kaolins in Gordon, Wilkinson county, Ga.

The Bickerstaff Brick Company, Columbus, Ga., which operates a plant across the state line in Alabama, reports that its orders for November were more than twice as large in volume as those for the same month in 1914.

ILLINOIS

The Bach Brick Company of Chicago is preparing to install a new brick machine with a capacity of 200,000 brick per day.

The Streator (Ill.) Brick Company has made several important improvements in its equipment, among which are a new waste heat drier, a brick machine and a cutter.

A number of Illinois brick manufacturers have announced their intention of attending the short course in ceramics that will be given at the University of Illinois, from the 10th to the 22nd of the present month. Some of them have arranged to send samples of their clay, in order that it may be tested as a part of the course.

INDIANA

The Ayer-McCarel-Reagan Clay Company, of Brazil, Ind., has recently purchased a specially equipped steam shovel, using crawler traction.

The Indiana Brick Company of Anderson, Ind., reports the receipt of an order for 80,000 red rough-textured face-brick, to be used in a school building being erected at St. Charles, Mo.

Another clay plant is to be located northwest of Brazil, Ind., if satisfactory arrangements can be made by the prospective investors. A delegation of Indianapolis capitalists is now engaged in what are believed to be the final negotiations for a site.

The Ayer-McCarel-Reagan Clay Company, of Brazil, Ind., has recently built a hollow-tile building, 60 ft. by 130 ft., for clay storage, and has erected sheds over all of its transfer tracks. It is now rebuilding its machine room, the walls of which are already finished.

IOWA

The What Cheer (Ia.) Clay Products Company is building a new thirty-six foot round down draft kiln of a very modern design. The company has been so successful in the rapid drying of its large tile and sewer-pipe that the thirteen kilns formerly at the plant have been unable to handle the ware as it came from the drier, making it necessary to add another kiln to the battery. The company is now finishing eight and nine kilns a week from one machine. A number of other improvements are being made at the plant, including the installation of arc lights around the kilns for night work. The sales department reports the receipt of enough orders to keep the plant going for several months.

KANSAS

The Pittsburg (Kan.) plant of the W. S. Dickey Clay Company is now devoting its entire capacity to the making of thirty-inch tile for drainage work being done in the Pecos Valley, New Mexico, by the Dickey company. The contract, which was obtained several months ago, calls for a total of three hundred and sixty miles of drainage and will keep the Pittsburg plant busy for eighteen months. It is the largest order the company has ever received.

KENTUCKY

In Richmond, Ky., W. W. Broaddus and Long Tom Chenault have purchased the business of the Richmond Coal and Supply Company. The new owners will handle a line of hollow-tile, brick and other building supplies.

The P. Bannon Pipe Company, Louisville, Ky., is supplying the brick for new passenger and freight depots at Jackson and Danville, Ky., which are being built by the Louisville and Nashville Railroad Company.

Another sale of white enamel brick has been reported by Leo M. Parsons, of the Tyler Building Supply Company, Louisville, Ky. The order is for the front of a theater which the Second Street Amusement Company is to build.

Small residence work in Louisville, Ky., is reported as progressing nicely, local architects being very busy. These operations are looked upon with favor by the average brickmaker, as they are usually small orders but at good prices—the kind of business that swells the annual profit.

The East End Brick Company, Louisville, Ky., reports a satisfactory demand. Not far from the company's plant are located the Elk Run distillery, of the Kentucky Distilleries and Warehouse Company, and that of the Mellwood Distillery Company. Both of these concerns have been making a number of additions to their buildings during the past few months. The former has had changes to make in connection with a contract it has taken from representatives of foreign governments for the manufacture of grain alcohol.

J. H. Bell, salesmanager of the Louisville (Ky.) Fire Brick Company, says that business with his company is excellent. One of the sources of good orders at the present time is the revitalized iron trade; everything that looks like a furnace in Kentucky being in operation. Among the orders which the company is delivering, are three calling for new linings for such furnaces, a total of about 1,000,000 fire-brick being used.

MASSACHUSETTS

Dolben and Sullivan, Boston and Lowell, Mass., dealers in brick and terra cotta, have announced the dissolution of their partnership, D. T. Sullivan retiring from the firm. His interest in the company has been purchased by Joseph A. Dolben, who will in the future conduct the business under the name of Dolben and Company, Seventh Street, Boston, Mass.

MICHIGAN

With the new addition to its plant which the Mercier, Bryan, Larkins Brick Company, of Detroit, Mich., recently completed, this concern will have an annual output of 65,000,000 brick.

MISSOURI

Kansas City, Mo., is apparently in the midst of a building revival. Figures made public recently show that building permits issued in 1915 totalled $10,574,930. The 1914 expenditure in that city was $10,204,970.

NEBRASKA

The Smith Brick Company, Omaha, Neb., has purchased ten acres of unimproved land immediately adjoining its

Down in the Pit

Where the big shovel is loading cars—half yard, one yard—every time it swings—you ought to have

A Baldwin Gasoline Locomotive light, speedy, powerful— to yank the loads out—the empties in.
Saves time—gets results—both mean money. Ask for Record No. 74. It's good.

The Baldwin Locomotive Works
Philadelphia, Pa., U. S. A.

WHATEVER equipment you need—don't buy until you know something about the

Lakewood Line

We Manufacture

Buckets, Kiln Bands, Pressed Steel Brick Pallets, Bearings, Portable Track, Ball Bearing Turntables, Switches, Richardson Double Die Steam Represses, also Miniature Hand Represses.

Cars of all kinds

Every piece of equipment is built of the best material by the best mechanics obtainable. The Lakewood Line is Built to Last.

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Lakewood Engineering Co.
Formerly the Ohio Ceramic Eng. Co. Cleveland, Ohio

LEHIGH PORTLAND CEMENT CO.
LEHIGH
ALLENTOWN, PA.—CHICAGO, ILL.

Why Most Brick Streets Use Lehigh Cement

Because it is not only **high in strength but dependably uniform.**

A perfect vitrified paving block of **your manufacture** used with a perfect cement filler of **Lehigh** Cement makes a permanent street for the city and a permanent highway for the country.

These are only a few reasons why more brick streets use **Lehigh** Cement than all others combined.

You Cannot Afford to Take Any Risk

Lehigh Cement is the perfect cement. Specify it always. It protects you. Set the proportions for the mixture. Adhere to them. Then your job will be uniform throughout.

LEHIGH CEMENT

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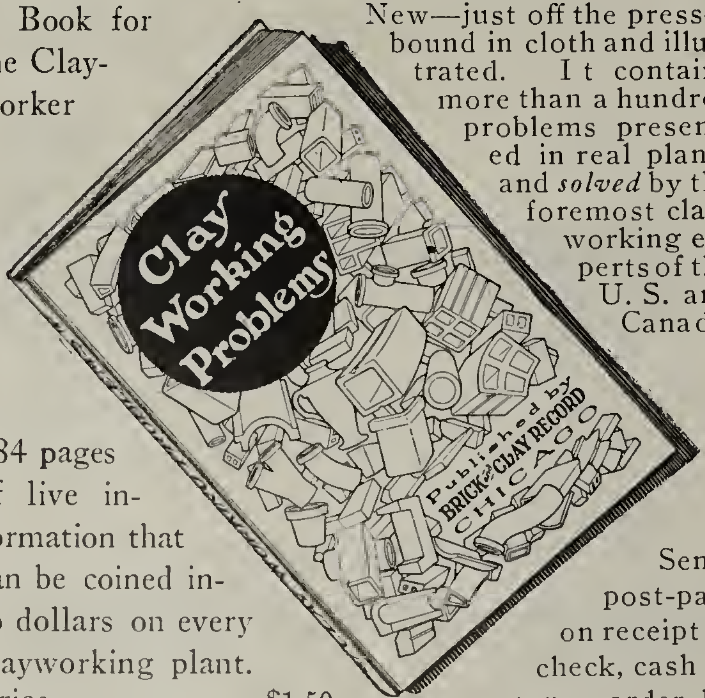
A Book for the Clay-worker

New—just off the press—bound in cloth and illustrated. It contains more than a hundred problems presented in real plants and *solved* by the foremost clay-working experts of the U. S. and Canada.


Clay Working Problems
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plant. The consideration is said to have been in the neighborhood of $10,000.

NEW YORK

The Raritan Clay Products Company, New York, N. Y., has been incorporated with a capital stock of $70,000, to manufacture brick, tile, terra-cotta and other clay products. The incorporators are: W. G. Demarest, 700 Riverside Drive; C. W. Cuthell, 52 Broadway, and A. J. Fraser, 138th Street and Mott Haven Canal, Bronx Boro, New York, N. Y.

The American Enameled Brick and Tile Company announces the removal of its general offices to the Vanderbilt Concourse Building, 52 Vanderbilt Avenue, New York City, where the Hay Walker Brick Company will occupy adjoining offices. Andrew A. Ayers and William G. Black, formerly of Carter, Black and Ayers, will be associated with Robert L. Findlay in the last named concern.

NORTH DAKOTA

A half million dollars invested in new buildings for 1916 is promised in Bismarck, N. D., according to present indications. During 1915, $35,000 was spent in new construction work, principally in the erection of one hundred and fifty new homes in that city. Plans now being prepared for 1916 work foreshadow a much larger expenditure in new work, including apartment buildings, a hotel addition and at least two extensive industrial plants.

OHIO

The Mohawk Clay Products Company, Perrysville, Ohio, is building a new warehouse at its plant.

The Webster Brick Company, South Webster, Ohio, has increased its capital stock from $100,000 to $200,000.

S. G. Nisley, of Springfield, Ohio, recently received the order for supplying the face-brick for the new Hotel Shawnee which is being erected in that city. About 400,000 brick will be required for the job.

The Buckeye Sewer Pipe Company, of Middletown, Ohio, has filed amended articles of incorporation reducing its capitalization from $300,000 to $150,000, for the purpose of reducing the expense incident to a large capitalization.

The Cleveland (Ohio) Art Association has invited about one hundred and sixty local artists to exhibit mural paintings in connection with the home building displays to be held at the Complete Building Show.

The Deckman-Duty Brick Company, of Cleveland, Ohio, has changed its corporate name to the Medal Paving Brick Company.

The American Sewer Pipe Company's plant at East Liverpool, Ohio, has resumed operations after having been closed since last July.

The Summit Brick Company, Summitville, Ohio, has been incorporated with a capital stock of $450,000 by H. B. Clark, George T. Whitacre, J. F. McDonald, Hopkins Hannum, E. S. Strolm and W. S. Schooley.

The Fulton Brick and Mining Company of Columbus, Ohio, has been incorporated by Frank E. Mohr, J. B. Meyers, L. R. Detwiler, B. George P. Mohr and George E. Plymire, with a capital stock of $5,000.

Almost every day, according to Secretary Will P. Blair, city engineers from communities at a distance from, and close to Cleveland, are visitors at the offices of the National Paving Brick Manufacturers' Association, where they confer with local experts on paving questions peculiar to their own cities.

A light-colored face-brick will be used in the construction of the new Stambaugh school building, in Youngstown, O., with terra-cotta for cornices and ornamental purposes. The building will be 72 by 165 feet, with two stories and basement, and will be modern in every respect. It will be fireproof, clay products being used thruout.

J. A. Meering and Son, brick and tile manufacturers of Napoleon, Ohio, are enlarging their plant by the erection of a three-story brick building, fifty by ninety feet, and the replacing of all machinery with that of an improved design.

One of the largest single purchases of material made in some time by the city of Dayton (Ohio) occurred recently, when City Purchasing Agent Fowler S. Smith awarded to Eichelberger and Sons the contract for supplying about 67,000 feet of sewer pipe. The pipe will be used in the construction of various sewer units authorized in a recent election, the work being handled by the city's engineering department.

Architect Franz Warner, of Cleveland, has received the contract for construction work on buildings for the Andrews Institute for Girls, at Willoughby, Ohio. This will mean a large order for brick, as it is of this material that the building will be constructed. Mr. Warner has at his disposal something like $5,000,000, for both the cost of the building and its maintenance.

At a special meeting of all Cleveland brick interests recently, Charles J. Deckman, of the Deckman-Duty Brick Company, was appointed chairman, and L. B. Koblitz, of the American Building Brick Company, secretary, of a committee which will prepare an elaborate program for the entertainment of the delegates to the National Brick Manufacturers' Association convention, at Hotel Statler, February 20 to 26, 1916.

Among the several large orders which have been recently awarded in Cleveland, three have been placed with the American Building Brick Company, according to L. B. Koblitz, of that firm. These include the brick for the new annex to the Hotel Hollenden, which will comprise 350 rooms; the addition to the Hotel Statler, 300 rooms, and the Stillman Theatre, which will be part of the Hotel Statler's new building, but which is a separate contract.

Instead of shrinking to nothing in December, as is usually the case, business with Cincinnati brickmakers and dealers this year has been better during the past two months than at any other time of the year. The Pursell-Grand Company, for example, states that November and December were better than those two months have ever been in previous years, while other concerns make similar reports. The Pursell-Grand Company states that its volume of business for 1915 is more than thirty per cent ahead of last year.

The voting of a one-mill tax levy for road purposes by the citizens of Montgomery county, Ohio, in which Dayton is the principal city, means that the highway construction program involving the use of brick on all of the principal roads will be carried out. Twenty-five miles of brick roads have already been built in Montgomery county, but the program now entered upon means that this amount will be considerably increased.

Despite a petition from a number of citizens of Sidney, Ohio, the Federal authorities refused to alter their decision and build the new postoffice there of limestone, adhering to the previously announced determination to use brick as the best and most economical material for the work. The brick structure will cost $51,000, and, inasmuch as $70,000 was appropriated, citizens of Sidney thought that the postoffice authorities might be induced to spend a greater amount than the sum of the bid for the brick building. Under a plan adopted by the department to standardize its buildings with reference to cost and size of

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For Pressure, Temperature, Electricity, etc.
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Bristol's Recording Instruments are unique in their extreme simplicity of construction and are guaranteed for satisfactory service under severe working conditions.

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BRANCH OFFICES
BOSTON NEW YORK PITTSBURGH CHICAGO

Your Ware Is As Good As You Make It!

To make a merchantable class of ware it devolves upon you to perfect each single phase of the manufacture—from the selection of the clays to the sorting of the finished product.

The correct measuring and mixing of two or more raw clays is of tremendous importance.

Financial success or financial failure depends upon the ability of your men or machines to standardize the batch.

To depend on your men to measure, to guess, to mix with shovel—or slide gate and chute is to have the batch run wild.

A dependable machine is your only alternative, and that machine is the Schultz proportioner—it measures, mixes and tempers. Set it and leave it. It does its work well.

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DU PONT
Quarry Powder
A New, Powerful, Quick-Acting Explosive
Especially Made for Winter Work

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ASK FOR NEW AND INSTRUCTIVE BOOKLET ABOUT EXPLOSIVES AND METHODS OF USING.

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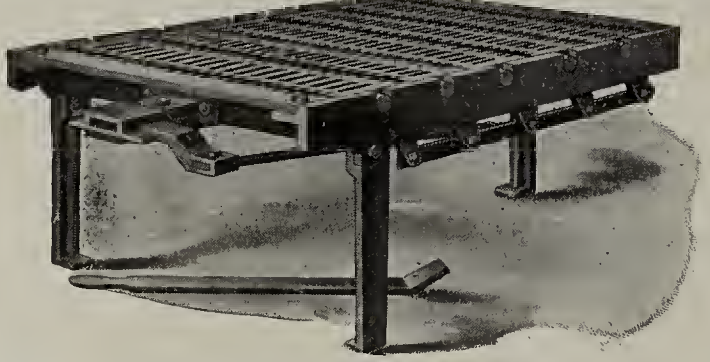
Powder Makers Since 1802
WILMINGTON, DEL.

PUT THEM IN THIS WINTER



The Canton Kiln Grate

From the time of the first installation in the kilns of the Massillon Stone and Fire Brick Co. of Massillon, O., up to the present time—dozens of sets have been installed—and are giving utmost satisfaction. Get a trial set, and prove with them that you can save over one-fourth of your fuel bill. Put them in just one kiln—their utility and the saving accomplished, convinces that the Canton is the only way.

The Canton Grate Co.
1706 Woodland Ave. CANTON, O.

towns, however, the request could not be granted, and brick will be used.

A compilation up to the last week in December, 1915, of building activity in Cincinnati for the year just closed shows that all previous records have been broken, notwithstanding many depressing factors. The previous banner year was 1911, when the value of the construction authorized was $13,383,000. Up to the date of the preliminary report issued by the building commissioner's office for 1915, however, more than $14,000,000 worth of work had been authorized.

The total for 1914 was passed by about $2,500,000, which is just $100,000 more than the valuation placed on the courthouse, the largest single piece of work for which a permit was issued in 1915. The exceptionally large number of residences erected was the real feature of the year's work, resulting in the distribution of business among a large number of brickmakers.

Much of the work authorized, including the courthouse and the million-dollar Hyde Park school, will be handled largely during 1916, which means that there is already ample assurance of good business for local brick manufacturers in 1916.

OKLAHOMA

A controlling interest in the Howard Brick Company of Claremore, Okla., has been purchased by C. A. Noll, a brick manufacturer of Wichita, Kan. Mr. Noll will assume the duties of president and general manager of the Howard Company, moving its headquarters to Wichita. The plant has a capacity of 50,000 brick a day and holds a franchise granted when that part of Oklahoma was Indian Territory. Mr. Noll is also president and general manager of the Blackwell Brick Company with offices at Wichita.

OREGON

In the vicinity of Cottage Grove, Ore., are clay deposits which have been pronounced of great value for the manufacturer of brick, tile and sewer-pipe. Tests have been made of this clay which showed the deposit to be of considerable size and of value for a number of uses. Actual development of this deposit, however, has not as yet been undertaken.

PENNSYLVANIA

The Kier Fire Brick Company, at Salina, Pa., is running to capacity and turning down orders for silica brick.

Miller Brothers of Rochester, Pa., a company which established a plant at that point about two years ago, is enjoying a large sale of its specialty—a light red face-brick.

The Eastern Pennsylvania State Builders' Supply Association will hold its annual convention in Philadelphia, Pa., during April, 1916.

The Joseph Soisson Fire Brick Company, at Bolivar and Connellsville, Pa., is running to its full capacity, and there is a rumor that this company will enter the magnesite field. If this be done, an electrical installation will be made.

The Kittanning (Pa.) Clay Manufacturing Company has installed a new brick machine at its plant. This company has recently added a rough-textured brick to its line.

The Garfield Fire Clay Company and the McFeeley Brick Company are running their plants near Bolivar, Pa., to full capacity, present conditions indicating that they will continue to do so for some time to come.

The Dando Brick Works at Vanport, Pa., has started work on extensive improvements at its plant near the Merrill Dam and will install electrical machinery in a new power plant which it is now building.

The Glen-Gary Brick Works, Shoemakersville, Pa., is at present working overtime owing to the great demand for brick in the Schuylkill valley towns. Ninety men are now employed at the plant, turning out 85,000 brick daily.

New kilns and additional driers now being installed at the plant of the Kittanning Face Brick Company of Kittanning, Pa., will increase the capacity of that plant from 75,000 to 100,000 high grade face-brick per day.

The Perry Manufacturing Company, of Layton, Pa., is doing a big business in common building brick, much of its product being used in connection with the mines in that neighborhood.

The Patton (Pa.) Clay Works, whose plant has been closed for a short period on account of labor troubles, is about to resume full operations. Extensive improvements are now being made at the plant preparatory to its being reopened.

The Kutztown (Pa.) Brick Manufacturing Company has received an order for 200,000 brick to be used in building an addition to the Boyertown Burial Casket Company's factory at Boyertown, Pa.

At the annual meeting of the Eureka Fire Brick Company of Mount Braddock, Pa., the board of directors declared the usual dividend of 1¾ per cent on the preferred stock and an eight per cent dividend on the common stock. The company is now operating all of its plants to full capacity.

In a reorganization of the Nanticoke Brick Company, Bloomsburg, Pa., the name of that concern has been changed to the Columbia Brick Company. At the same time the following officers were elected: Thomas Turner, president; L. S. Oplinger, vice-president; George W. Turner, secretary, and A. D. Smith, treasurer.

The Beaver Clay Manufacturing Company, of New Galilee, Pa., has started excavations for a duplicate of its plant at the above named town, the buildings to consist of a boiler house, power station, additional kilns and a building to house the dry-pans and other machinery. The company will do its own building and will purchase all the material excepting the brick. It is estimated that the new work will cost in the neighborhood of $300,000.

The management of the brick plants at Johnstown and Irvona, Pa., owned by Hiram Swank's Sons, announced recently that approximately $45,000 will be spent during 1916 on improvements, the greater part of which will be made at the Johnstown plant. It is the intention of the management to make the combined output of the two plants reach 30,000,000 brick a year. Four new kilns will be built at Johnstown. A large dryer will also be installed.

A large building at the Flory Brick Yards, Roslyn, near Glenside, Pa., was destroyed by fire recently. A few hours after the firemen left the ruins, a watchman found the charred remains of a man in the ashes of the building. The structure was used by forty workmen as a living place. The brickyards are owned by James Flory, of Haverford, Pa., who has other plants at Downingtown and Royersford. The loss is estimated to be about $1,500, the fire being started from an overheated stove.

Keiser & Miller, lessees of the Kutztown, Pa., brick works, sustained a considerable loss thru defective machinery when, a few weeks since, a breakdown caused a complete stoppage of ten days. The plant had a number of large orders on hand, and builders were anxious for material with which to get under cover before the winter set in. A little of the "Economy of Buying Well" would have saved some of the delay, not only for the brick plant owners, but for those who depended upon them for material.

According to statistics prepared by William Gamble of the Bureau of Building Inspection, Philadelphia, the cost

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You can't get the kilns unloaded on time—You can't prevent accumulated demurrage on cars—You can't have satisfied hustling wheelers—

UNLESS

You have a fleet of
INVINCIBLES

Look!

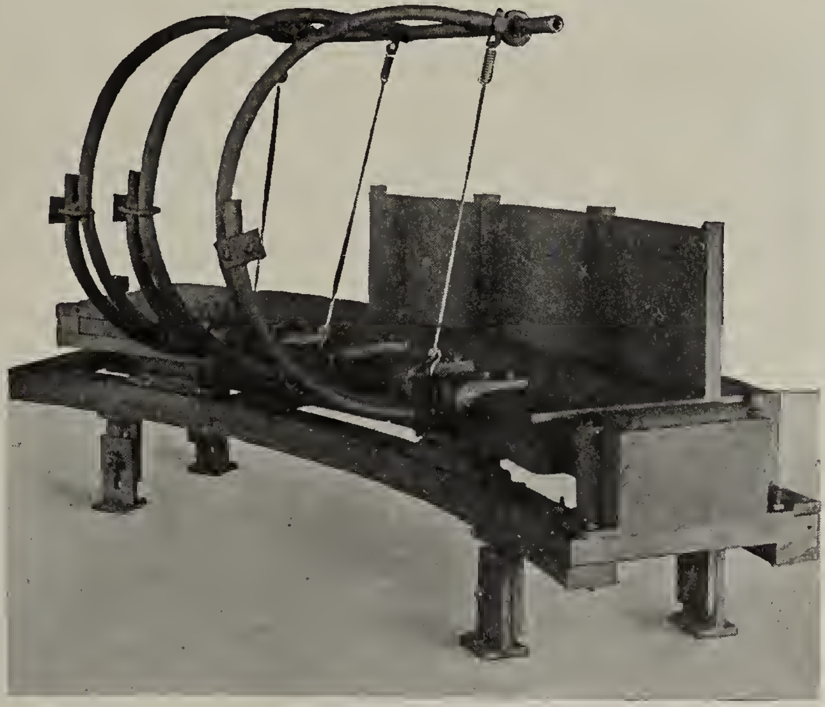
IT
IS
BALANCED

The axle is under the load—NOT at one end of it.
It slides—down the runway—and the hind legs don't rip and tear.

It Rides Its Load

THE TORONTO FOUNDRY AND MACHINE CO.
TORONTO, OHIO

The New Cutting Table for Radial Silo Blocks
Cuts Radially
Complete Iron Frame (No Wood) Built Like a Machine Tool



The Table the Silo People Are Talking About
A one man Machine. Built at BRAZIL, IND., the clay product center. The price is $175.00
CRAWFORD & McCRIMMON COMPANY
47 Years Successful Manufacturing.
Modern New Daylight Shops
BRAZIL, INDIANA

of building operations in that city during 1915 exceeded those of the previous year by $2,500,000. The total estimated cost of all building work during November is $2,408,665, showing a decrease of $572,000 as compared with the figures for the previous month and an increase of $1,168,135 over the corresponding month of 1914. The first eleven months of this year show expenditures for building operations of $36,841,055, an increase of $2,682,800 over the corresponding period of 1914. November of this year represented the third largest amount since 1905.

The National Fire Proofing Company, Pittsburgh, Pa., has decided to list its shares on the New York Stock Exchange, thereby securing a wider market for its securities. One of the requirements of this listing is that stock certificates shall be interchangeable between New York and Pittsburgh, and in order to have the shares listed, it was necessary to have new stock certificates engraved. The company has announced that, if stockholders desire to secure interchangeable certificates, they must present the ones now held to the transfer agents, the Commonwealth Trust Company of Pittsburgh or the United States Mortgage and Trust Company of New York.

A convention of special interest to brick manufacturers will be held at Reading, Pa., on March 9 and 10. It is the annual meeting of the Pennsylvania Housing and Town Planning Association at which Governor Martin G. Brumbaugh and Dr. Samuel G. Dixon, state health commissioner, will deliver addresses. Indications point to this convention as being one of the largest held in Reading for some years, as delegates from every section of the state will be present. The sessions will be devoted to the discussion of three topics—housing, health and city planning. Reading, during the past few years, has paid particular attention to housing conditions, an article on the brick-built homes for workingmen having been published in this magazine a little more than a year ago.

TENNESSEE

At Maryville, Tenn., C. O. Jackson, a veteran brick manufacturer, in conjunction with Frank Eagleton, hardware dealer of Maryville, has organized a brick manufacturing company and is building and will equip a plant with a capacity of 50,000 brick daily. The plant, which will be prepared for all-the-year-round work, will be located close to the Louisville & Nashville tracks and will have a switch.

Articles of incorporation have been filed at Paris, Tenn., by the Paris Tile, Roofing and Flooring Company, which will have a $20,000 capital and will engage in the manufacture of roofing, flooring and other tile. It is stated that a large clay plant will be erected in the southern part of the city.

TEXAS

The Emmet Brick and Tile Company of Gonzales, Tex., which was recently organized with a capital stock of $30,000, will install new machinery at its plant.

An order for approximately half a million common brick was recently closed by the Dabney Brick Company, of Galveston, Tex., for the new Science Hall at the Huntsville, Tex., penitentiary. The same concern has sold approximately 40,000 face-brick, 6,000 pieces of hollow-tile fireproofing, and 200,000 common-brick, all to be used in the new Armour packing plant in Galveston.

The Sunset Brick and Tile Company, Gonzales, Tex., one of the largest brick manufacturing concerns in that part of the state, but which, owing to financial reverses, has not been in operation for the past year, has been reorganized with a capital stock of $30,000. O. B. Robert-

THWING HIGH RESISTANCE MULTIPLE RECORD PYROMETERS

Never Sleep

If the burner knows that his work is being

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every few minutes, he will stay **On the Job.**

Multiple Recorders reduce the cost of installation.

How Many Kilns Have You?

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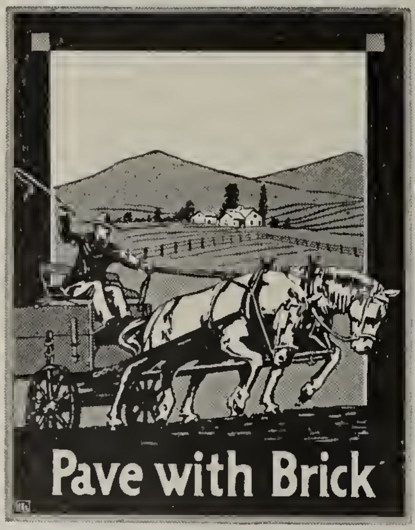
POSTERETTES



200,000 of the "Build with Brick" posterettes have been used by brickmakers throughout the country. As many pieces of mail and express matter have carried the "Build with Brick" slogan to a vast army of prospective homebuilders.

Here is the second edition—the stamp advertising paving-brick. It tells a story that carries a moral—and that moral means better business for the men who make paving-brick.

How about using some of them—now?

Printed in THREE colors

Gummed and ready to stick on your letters, envelopes and packages.

$1.50 per thousand postpaid

Send your orders to

BRICK AND CLAY RECORD
445 PLYMOUTH COURT CHICAGO

son, R. L. Robertson and W. T. Miller are the incorporators. The plant is now being overhauled and new machinery installed.

The Dabney Brick Company, of Galveston, Tex., reports that, despite the pessimistic predictions which prevailed a short time since concerning Galveston's future, the old town "came back" in great shape, and that it is rebuilding with brick. R. Dabney Johnson is general manager of the company, J. A. Millon being assistant manager. Both men received their early brick training in the New York City office of Fiske & Company, Inc.

The Whitselle Brick and Lumber Company, Corsicana, Tex., according to Max D. Almond, vice-president and general manager, finds that business is beginning to show some improvement in the Southwest over the early summer months. A heavier inquiry for brick is predicted for building operations which are scheduled to begin soon after the first of the year. A gas burning system has been installed at this company's plant which is now being used instead of oil, as formerly, giving very satisfactory results and producing brick of a much better color.

UTAH

The erection of several new kilns has been started at the plant of the Ashton Fire Brick and Tile Company, at Ogden, Utah. A number of improvements will be made at this plant during the winter months, including the building of a new stack nine feet in diameter and one hundred and ninety feet high, the largest stack, it is claimed, in Utah.

WASHINGTON

The Chelis (Wash.) Brick and Tile Company recently received an order for 420,000 brick to be used in the construction of a refuse burner for the Grayson Harbor Lumber Company at Hoquiam, Wash. This burner, sixty-five feet in diameter and ninety feet high, will be the largest of its kind on the Coast.

The American Fire Brick Company of Spokane, Wash., has received an order for the face-brick which will be used in the five-story office building and warehouse, now under construction, for the Powell-Sanders Company of that city. The American company will also furnish 25,000 pieces of hollow-tile to be used in the interior walls of this building. An order has also been received for twenty-six cars of fire-brick to be used in the erection of dry kilns for eastern Oregon lumber companies.

"A year ago we thot we were doing a fair business. Today the volume is four times what is was at that time," according to J. H. Spear of the Washington Brick, Lime and Sewer Pipe Company, Spokane, Wash. The largest order booked by this company during November was that for the state institute for the feeble minded at Medical Lake, Wash. The order calls for 1,500,000 common-brick, 70,000 pieces of partition tile and three carloads of terra cotta. Among the other orders taken during the past month, were those for fire-brick for the Tacoma Smelter and the Rutledge Timber Company, a total of twenty-six cars, and fifty carloads of common-brick for the Trail smelter. The company's Clayton plant is running to full capacity, while the sewer-pipe plant at Spear is being kept busy with a large number of orders. The company considers the outlook for next year as being the brightest it has ever had.

WEST VIRGINIA

The G. & R. Clay Company, Nelsonville, W. Va., has been incorporated by Walter Graham and others with a capital stock of $2,000.

A satisfactory run for 1915 is reported by the Hammond

You can get a higher price for your brick if you guarantee it will be

Scum-Proof

And you can do this with perfect safety by using

R. H. Precipitated Carbonate of Barytes

It neutralizes the salt in your clay so that it cannot appear on the surface of the brick after it gets wet.

But don't accept a substitute—insist on R. H. —**the dependable brand.**

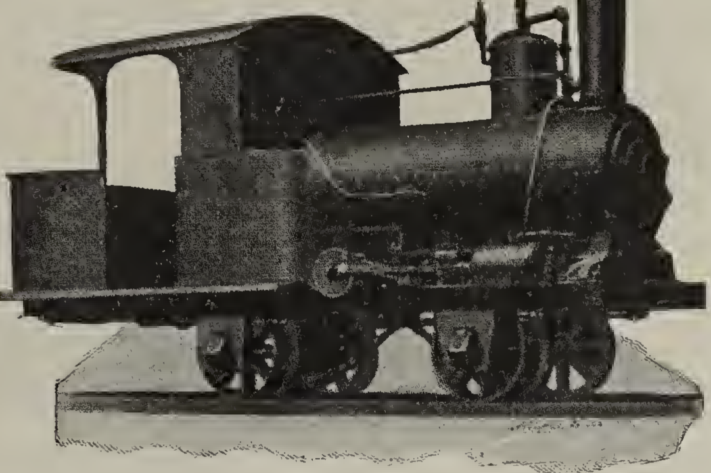
Write for circular and prices.

The Roessler & Hasslacher Chemical Company
100 William St. New York

Chicago, Ill. East Liverpool, O. St. Louis, Mo. Kansas City, Mo. New Orleans, La. Philadelphia, Pa. Boston, Mass.

We carry a complete line of high grade chemicals for the clay industry

"Getting There" on Four Wheels



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Costs $1200 About as Much as a Good Team of Mules

It Never Balks on Heavy Loads or Grades

It pulls a full load under every condition and on any track. Does more and costs less than any type of Standard Locomotive of same size and power.

"Let the Dewey Do Your Work"

Write

for descriptive literature and "reasons why" you will save money by having the Dewey in your plant.

DEWEY BROS.
GOLDSBORO, N. C.

A Tried and Proven System for Burning of Clay Products

The kind of **EVIDENCE** that is **CONVINCING**

Mr. J. A. Conley, of Harpster, Ohio, under date of December 10th, writes as follows:

OHIO KILN CO., Vigo, Ohio.

Gentlemen: We are pleased to tell you that our **24 FT. IMP. HOOK PAT. UP AND DOWN DRAFT KILN** is being burned regularly in 35 **hours from start to finish.** And we are burning **15,000** 4-in. drain tile with **$4.00** less fuel than it formerly took to burn **10,000** pieces with our old down-draft kiln. The production of ware is much better, all being burned **hard and uniform from top to bottom of kiln.** We feel it our duty to tell others, and will answer any inquiries in regard to it.

With best wishes, we are

Very truly yours,
HARPSTER TILE WORKS,
Per J. A. Conley, Mgr.

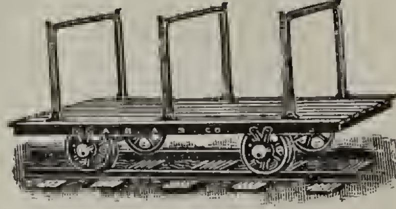
NO OTHER SYSTEM LIKE IT
When asking information or ordering plans
FROM OUR COMPANY
You get all of Mr. C. HOOK'S latest improvements.
OUR SPECIALTY
Is designing and building Round, Square and Rectangular Kilns

Ohio Kiln Company, Vigo, Ohio

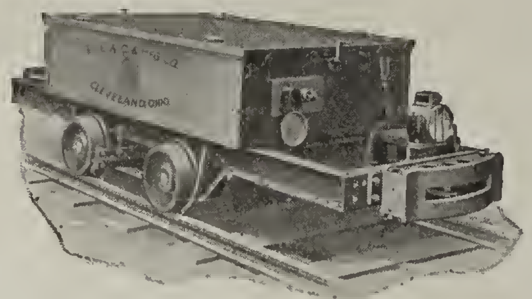
REDUCE YOUR HANDLING COSTS
By the Purchase of Efficient Equipment

No. 217-E. Side Dump Car Equipped with Motor

ATLAS
High Efficiency
Cars and
Electric Locomotives



No. 126 Double Deck Dryer Car



will meet your requirements. Let us send you catalogue and quote prices.

Storage Battery Locomotive for general use.

THE ATLAS CAR & MFG. CO.
1287 Marquette Road, Cleveland, Ohio

Fire Brick Company, Fairmont, W. Va., manufacturers of high-grade clay products for glass factories, furnaces and coke ovens. An enviable operating record has been made by this company whose plant has been idle but six weeks during the past seven years—a record that speaks volumes for the quality of this company's ware.

Following a long established custom, every employe of the Thornton (W. Va.) Fire Brick Company, from the general manager to the pit laborers, received a turkey for Christmas. "Business is good and we are looking forward to one of the most prosperous years in our history," said a representative of the company. The plant will be operated to full capacity thruout the winter.

WISCONSIN

The Union Grove (Wis.) Tile and Brick Works recently booked an order for drain-tile that calls for fourteen carloads, some of which will be laid in the state prison grounds at Waupun, Wis.

With the intention of beginning at once the construction of a modern brick plant, the Cook and Brown Lime Company, Oshkosh, Wis., has purchased a site near the city formerly occupied by a sawmill. The clay to be used in the plant will be shipped by water from the company's deposits near Stockbridge on the east shore of Lake Winnebago. This will mean the full employment of the company's large fleet of boats and barges during the spring, summer and autumn months. It is expected that about fifty men will be employed in and about the plant.

Pottery Notes

A Resume of the Activities of the Potters and Some Mention of their Plans for the Future.

With Canada buying more American pottery and the home consumption showing an increase, the production and sale of American pottery for 1916 gives early promise of being the largest in the history of the trade. The large jobbing interests of the country, which in the past have been making a feature of imported wares, are now turning their attention to American-made lines, and from this channel alone, a large business is bound to come. In fact, a number of such houses have already placed open stock orders for delivery early in the new year.

Business with the potteries in the Ohio section for November and December has been such that plants have been operated to capacity, and more than one decorating shop has worked nights. Other departments of certain plants have also been in operation on Sundays. Manufacturers have bent every effort to take care of the heavy business, but in spite of that fact, some orders which were wanted for the holiday trade were not shipped. The buyers failed to anticipate their requirements as urged to do by the salesmen, and now they are the ones who will have to suffer the loss in trade.

Thomas A. Anderson, for the past twelve years general manager of the manufacturing departments of the Edwin M. Knowles potteries in Chester and Newell, W. Va., retired from that organization January 1, being succeeded by Harry Watkins, formerly superintendent of the manufacturing department of the Potters' Co-Operative Company's plant in East Liverpool, Ohio. Mr. Anderson has not announced what he will do, but it is conceded that he will be identified with another large pottery organization in the Tri-State territory.

The report is current in the East Liverpool (Ohio) district that a new seven-kiln pottery is to be built in that vicinity soon after the first of the year. Those who are mentioned as being connected with the new enterprise refuse to talk of plans, or admit their connection with the proposition. It is known, however, that plans for a new pottery are now being drawn, but the architect refuses to name his client.

"Activity"

(Continued from Page 27)

state for many years to come.—*H. L. Aldrich, president,* "International Marine Engineering," New York.

Power Plants

The power plant interests are looking in your direction for fire-brick and furnace materials that will stay in shape at temperatures up to 2,800 or 3,000 degrees Fahrenheit. In a paper upon "The Boiler of 1915," presented to the Engineering Congress held in connection with the Panama-Pacific International Exposition, Arthur D. Pratt said: "The second factor is furnace brickwork. With the increased combustion rates of modern practice, and the higher furnace temperatures of the present-day furnace, the conditions which the brickwork of the furnace is called upon to withstand are much more severe than in former practice. Fortunately, progress in the art of brick manufacture has accompanied the movement toward higher capacity, and firebricks as manufactured today, when properly installed, are able to withstand over considerable periods and under practically all conditions of service, temperatures and variations in temperatures, that some fifteen years ago were not practicable from the standpoint of furnace upkeep cost." To those who are trying to use coal in the powdered form for steam making, a furnace lining which is at the same time stable at the above temperatures and not prohibitive in cost, would be especially welcome. The effect of the composition of the fuel, or of its ash, upon the fusibility of the firebrick furnace, has been pointed out, some ash seeming to act as a flux with some brick, with the result that some combinations of brick and ash produce trouble from fusing and clinkering at temperatures below the melting points of either the ash or of the brickwork.—*F. R. Low, editor "Power," New York.*

In power plant lines, there is, of course, increased activity due to the general revival of industries and starting up of plants. So far this has not called for any enlargement and the activity is one of overhauling and somewhat of rearranging.—*Arthur L. Rice, editor "Practical Engineering," Chicago.*

Rail Roads

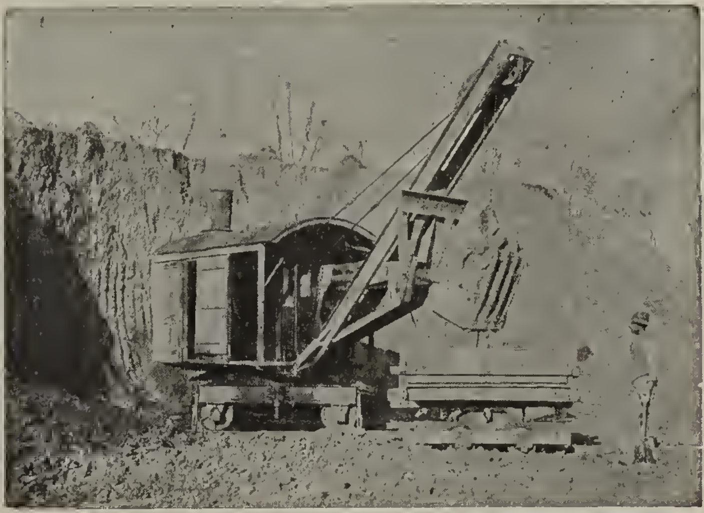
The optimistic tone of business in general has increased the purchasing power of the railways more than 100 per cent within the last two months and it is our opinion that it has only begun. As to the effect upon the clayworking industries—the railways will need more furnaces and will build more permanent structures and will stimulate the manufacturing field. The writer has often wondered why the clayworking industries do not produce, for the railways, portable furnaces to erect around locomotive frames to use while repairing the frames with oil. There

THE THEW SHOVELS

Would You Like to Know Just What It Costs Others to Dig Clay and Shale?

THEN JUST ASK

for Circular 22 A. In it is compiled a record of actual results gathered from 55 different clay plants, many with conditions identical to your own. Cost per ton, per yard, and per thousand of brick are given, several photos of clay pits are shown, and other information incorporated of a character that will interest all clayworkers.



Thew Shovel which saves wages of 10 men every day

There are now

Over 300 Thew Shovels in the Clayworking Industry

a fact which conclusively proves their great adaptability for the conditions peculiar to this work.

The Horizontal Crowding Motion and other Thew features of particular advantage in this work are also fully described in this circular.

This is just another booklet such as business men are anxious to read in order to keep abreast of the times with reference to their industry.

Send for your copy today.

SIGN AND MAIL OR USE FOR MEMORANDUM

The Thew Automatic Shovel Co.
Lorain, Ohio

Send me circular 22 A, giving cost facts for digging clay and shale and other information of interest as advertised in "Brick and Clay Record."

Name..............................

Address..............................

THE THEW AUTOMATIC SHOVEL CO. LORAIN OHIO

is a book every brickmaker should have

Your responsibility does not end with the turning out of a first class brick. You should know how to use your brick to show it off to the best advantage.

This book is a complete and clear manual of brick construction, designs and details. It tells what every builder should know of the classification and measurements of brick work, together with architect's drawings of framing for brick houses and the use of brick veneer.

It also tells of the miscellaneous uses of brick, including ornamental brick and tile work, chimney and flue construction, brick fireplaces, brick sewers, cisterns and flush tanks, etc. It tells the builder everything he should know to undertake brickwork and it is so clearly illustrated by details that there can be no uncertainty as to each successive step to be taken.

The designs in this book alone are worth the price.

GET ONE NOW

Price $1.00

Book Department

Brick and Clay Record

CHICAGO

is a great field for some live concerns to cultivate this business. All railway shops have frames to repair and many are doing it with oil without removing them from the engine.—*E. C. Cook, editor "Railway Journal," Chicago.*

The experiences of the electric railway industry in 1915 have not been unlike those of the country as a whole, with the same combination of early depression and later improvement. The stagnation in orders for new equipment and in new mileage placed in operation, was noticeable during the first nine months of the year, has in the last three months turned into an appreciable activity.—*Ralph R. Bruster, associate editor "Electric Railway Journal," New York.*

The coming year will be the best ever experienced in the signaling field. There seems to be more new work contemplated at the present time than has ever been installed during one year in the past. The construction of brick interlocking towers and of clay conduit systems for distributing electric currents will be stimulated.—*H. H. Simmons, editor "The Signal Engineer," Chicago.*

City Work

In general I presume that the clayworking industries are especially interested in sewer pipe and paving-brick so far as the municipal field is concerned. From our knowledge of what has occurred during the present year and predictions for 1916, we judge that the demand for both of these will be a little above normal and that that for the brick will be greater than the amount consumed in 1915; the reason for the latter being largely because of the fact that weather conditions during the spring and early summer of 1915 were seriously adverse to pavement construction and much work which would otherwise have been done this year has been necessarily postponed until next.—*A. Prescott Folwell, editor "Municipal Journal," New York.*

Hotels

My judgment, formed after an extended tour of the country, leads me to state that the outlook for hotel business for year 1916 is promising. Quickened industrial activity is creating increased traveling of commercial men and salesmen. Tourists and persons of wealth and leisure recognize more fully than ever the superiority and transcendent interests of the resorts and spas of the United States. These facts have a large bearing upon the hotel business, with a consequent increase in revenues for the hotels. This increased demand for hotel accommodations coupled with the natural growth of the country is encouraging the erection of many new hotels. This construction of necessity must be reflected in an increased demand for brick and clay products.—*F. Melville Lewis, publisher "Hotel Life" Cleveland.*

The modern hostelry embodies much that is artistic, convenient, safe and luxurious. Included in the equipment of some hotels are many of the most ingenious inventions of the age. The fire-proof building has superseded the fire-trap and noisy partitions have given way to sound-proof walls. One of the serious mistakes of architects is providing for thin plaster partitions between sleeping-rooms, not exceeding one or two inches in thickness. If the bed-rooms are narrow compartments it is obvious that one or two-inch walls are insufficient to make the rooms sound-proof. After an exhaustive investigation along these lines the writer has come to the conclusion that the average plaster walls of the thin variety are the best conductors of noise to be found. It should be urged upon architects and engineers that they give more attention to solving the sound-proof wall problem, for this is to be an equally important feature in hotel or apartment house construction in the future. From actual investigations it has been found that brick or hollow-tile of sufficient thickness makes the best sound-proof wall for any purpose. So, then, it is an irrefutable fact that the best results can be obtained in interior wall construction by the use of hollow-tile or specially-made brick of from two to four inches thick. Such material can be used to obtain the best economic results in exterior steel-frame construction, because brick or hollow-tile will not warp, sag, nor melt from heat, and are laid in units instead of as a monolithic mass.—*R. Edward Lewis, editor "The California Tourist and Hotel Reporter," Los Angeles, Cal.*

The year now closing has not been a favorable one for new hotel projects but the tide has already turned as indicated by reports received from all parts of the country. The coming year will be one of activity in the construction of new hotels. —*John Martin, publisher "Hotel Gazette," New York.*

The crusade for fireproof hotels has compelled the use of clay products in larger and larger measure. They are indispensable to the fireproof quality; they are a matter of course. The demand will be a constantly increasing one.—*John Willy, publisher "The Hotel Monthly," Chicago.*

In this mild climate where plaster and frame exteriors on smaller apartment houses and hotels have been practical, brick has taken the lead despite the greater expense for construction. The modern structures of this character are not at all the old familiar brick buildings of the East but each one has its individuality and charm. As far as our West goes, the era for development of the brick industry is only in its embryonic stage. The use of brick in the interior decoration of hotels and apartments recently constructed in southern California has increased wonderfully. A number of hotels have succeeded in finishing the entire rooms in brick and thru carefully worked up decorative schemes have removed any sense of coldness that might otherwise go with this kind of building material. Thru the application of new theories in coloring, brick and tile have developed a greater artistic advantage than ever before. Architects of structures that are somewhat public in character have realized this advantage and are applying it more successfully than ever in the past.—*J. D. Minster, publisher "Pacific Coast Hotel Record," Los Angeles, Cal.*

Gas

According to Brown's Directory of American Gas Companies, there are 1,174 plants manufacturing city gas in this country, each one of which uses a large quantity of fire-clay material every year for repairs, renewals and extensions. The gas business is growing at the present time at the rate of about nine per cent per year, which means that the gas producing capacity increased in the same proportion, including, of course, the quantity of refractory material used. This proportion will probably increase, as business conditions improve, to twice this percentage.—*H. K. Landis, managing editor "The Gas Age," New York.*

Present conditions in the gas industry have considerable influence on the American market for refractories. From the infancy of the industry, English and German made fire-clay retorts had been considered necessary for the best carbonizing results, and only of late years has the gas engineer given the home market sufficient encouragement and assistance to develop refractories suitable for his requirements. This development is seen particularly in the widely extending use of sectional silica retorts and shapes of domestic manufacture The shortage of fire-clay, recently noted in English circles, and the general effect of war upon commerce will accentuate this condition. America can produce refractories suitable and efficient for any process. The careful study given the

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YEAR after year the number of concerns who use GANDY STITCHED COTTON DUCK BELTING has grown, until today there are thousands in all parts of the country.

These concerns could only use it if it actually saved them money—otherwise they would not reorder, nor would new concerns after once trying GANDY adopt it.

So we ask you to find out, just as others have done, whether Gandy Stitched Cotton Duck Belting can reduce your belting expense, as it has for them.

Remember, you are not making an experiment. Gandy's 37 years of use is evidence enough of its reliability. In writing us for information about prices, etc., you are not obligating yourself in any way, but merely placing yourself in a better position to consider it more definitely. If GANDY can save you money, as it has done for so many others, you want to know it.

Write us today.

The Gandy Belting Co.
732 West Pratt St.
Baltimore, Md.
New York Branch, 36 Warren St.

question of fire-brick specifications by the American Gas Institute has helped to standardize the gas-makers' requirements.—*S. K. Campbell, editor "Gas Light Journal", New York.*

Florists

There is a disposition among nursery men and florists on this coast, at this time, to manufacture large vases and flower pots from cement. This class of goods is too heavy for practical purposes and yet there seems to be no other alternative because clay products people either could not or would not get clay of the quality that would make light and durable receptacles for plants. The cost in transportation of clay goods across the continent made the price prohibitive except to a very few people of very large means.—*P. D. Barnhart, editor "The Pacific Garden," Los Angeles, Cal.*

The readers of "Brick and Clay Record" who are manufacturers of clay pots or jardinieres and other glazed ware sold in flower stores—especially those who advertise in the "Florists' Review,"—already have noted the marked increase in business which has come among florists this autumn. Many persons who consider flowers a luxury are surprised to learn that the florists' business has been more nearly normal than almost any other line, during the past year and a half. The explanation is that the greater part of the flowers are sold to people who are fairly well-to-do and who have not been compelled to curtail their living expenses to any great extent during the time of general business depression. The preparations for Christmas were on the largest scale ever known, and so great is the confidence in the future of this trade that we hear of extremely large greenhouse building operations planned for spring.—*H. B. Howard, managing editor "The Florists' Review," Chicago.*

Electricity

In practically every division of the business, the electrical business appears to be making rapid strides toward a very material improvement. Our electrical manufacturers report increasing demands for generating apparatus for motor equipment and for wiring devices of every description. Owing to the great demand of other industries for copper, zinc and spelter, prices for these materials, which enter very largely into electrical equipment, are on the rise, and the supply is also showing a tendency to become restricted. This will tend toward stabilizing the industry and improving the price conditions which may be obtained for standard articles of manufacture. With respect to the participation of the brick and clay industries in the development which appears certain to come in the electrical industry, I might direct your attention to one particular instance. Within the last few years in a very quiet but practical way, electric furnaces for the production of high quality steel on a commercial scale have made considerable headway. In fact, electrical energy is being utilized in a great many industrial heating applications. For all of this work brick and clay refractories of some description do and will enter largely. I do not know where the limit of temperature for the high capacity electric furnaces will be reached, but it seems reasonable, under present conditions at least, to expect that in electric furnace and other industrial heating applications there will be a greatly increased use of brick and clay refractories in some form.—*A. A. Gray, managing editor "Electrical Review and Western Electrician," Chicago.*

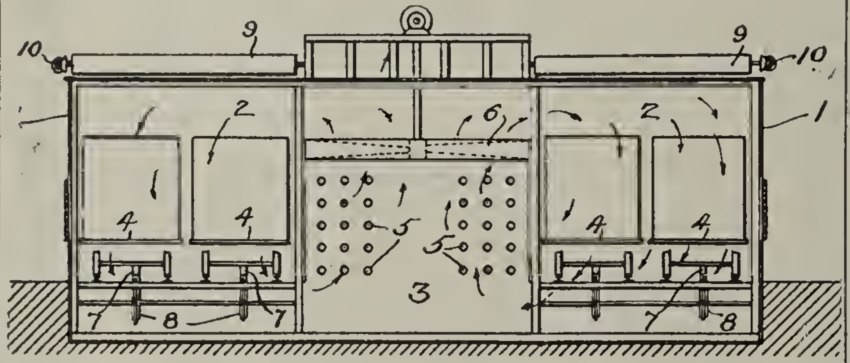
Electrical utilities are now finding it easier to obtain capital, and therefore the coming year will see considerable activity in building, much needed to take care of their rapidly growing business. We have had a peculiar condition in this

The
"PROCTOR"
Drying System

Is simply practical adaptation of well known principles regarding the application of heat to clay and the constant circulation of the heated air.

It is not an experiment—but it has proven its efficiency in every day practice in some of America's finest clay plants.

Study this plan for a few minutes and you'll grasp the idea:



This is a transverse sectional or end view. The steam coils (5) are shown just beneath the fans (6) and the trucks (4) carrying the green ware are on either side, (7) having projections which engage an axle on each truck. These chains pass over wheels (8) which, turned, either by hand or power, the trucks may be moved a predetermined distance.

In another type of the "Proctor" the steam coils (5) are on either side of the trucks (4). This is a better arrangement under certain conditions.

By a simple arrangement of fans the heat waves, which move, naturally, *upwards,* are kept in *active* circulation and, literally, like a hot and powerful torrent, are forced to penetrate every nook and crevice in the drying chamber.

By another simple mechanical device the conveying cars pass through this torrent of uniform heat, at a *regulated* pace.

There's More To Tell About
The "Proctor" Way—Ask Us

Philadelphia Textile
Machinery Co.
Hancock and Somerset Streets
PHILADELPHIA, U. S. A.

business. While the number of electric light and power users has continued to increase substantially even during the most depressed months following the outbreak of the war, the capital needed to take care of construction and extension of power houses and distributing systems has been very hard to procure upon a reasonable basis. The result was that such construction practically ceased. It may be expected to resume generally throughout the country now that financing is easier. While the electrical industry uses brick and clay products to a considerable extent, the service we can render to the clay industry lies less in what we buy than in what we sell. The electrification of brick and clayworking plants and the selling to such plants of energy furnished by our central stations will mean greater prosperity to you than any profit you might hope to win through the sale of your products to us.—*Frank B. Rae, Jr., editor "Electrical Merchandise," New York.*

So far as clayworking is concerned, this would touch mostly upon the porcelain as used for electric cut-outs, switches and similar devices where porcelain is used; the manufacture of equipment for lighting installations as well as the contractors engaged in the installation of this equipment are busier than they have been for years. In the metal line, many of our fixture concerns have more unfilled orders than at any time during the last five years.—*Norman Macbeth, editor "Lighting Journal," New York.*

Motor Trucks

The motor truck industry is making the greatest progress of its history. In the ensuing year, even greater progress is anticipated. The motor truck industry everywhere is building extensive additions and dealers in motor trucks are becoming more numerous. Among the latter, especially, will be a great deal of building activity.—*M. C. Horine, editor "The Commercial Vehicle," N. Y.*

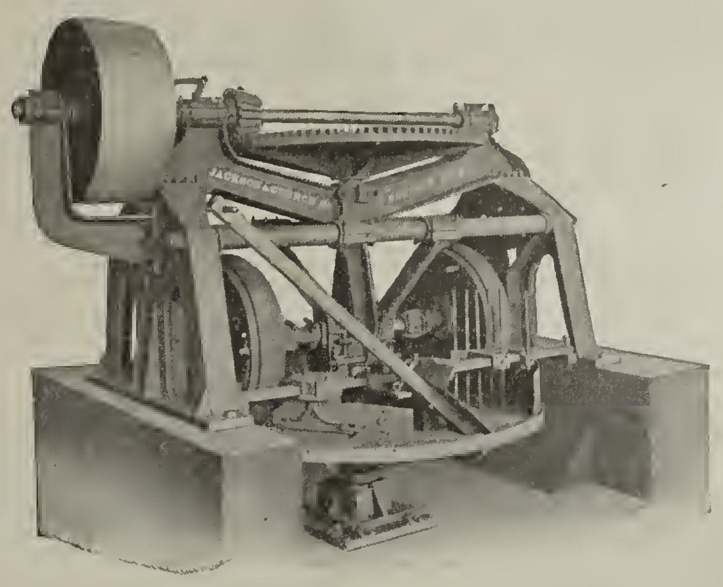
The truck end of the industry, with $30,000,000 to $35,000,000 in cash for trucks exported to the warring nations (and this but about twelve per cent of the total of the value of the output) is on its feet more firmly than ever before. Manufacturers are now supplying the tremendous and ever-increasing demand for small capacity vehicles of one thousand to fifteen hundred pounds, and home consumption is increasing at a tremendous rate.—*E. S. Foljambe, editor "The Commercial Car Journal," Philadelphia.*

Science

While I know very little about the brick and clay industry, it seems to me that it has not made any effort to find new uses for its products. The steady inroads which concrete has made can be offset only in that way. Furthermore, so far as I know, very little has been done to invoke the aid of scientific and industrial research in order to adapt clay products to specific uses. At least a dozen industries have sprung up in the last ten years because industrial scientists have been employed to study manufacturing method and products which so-called business men have regarded as standard and unchangeable. As soon as an industry becomes stagnant it may usually be regarded as a sign that no scientific thought is being expended upon its processes.—*Waldemar Kaempffert, editor "Popular Science Monthly," New York.*

Good Roads

The advantages of good roads have been talked about so vigorously that the substantial farmers are fully convinced. A notable accompaniment of this sentiment for improved roads is a widespread demand that these roads be made as nearly permanent as possible with yearly up-keep at a minimum. Makeshift roads are recognized as temporary improvements only. They will be constructed in the future, but in their making, the idea of per-



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Wet or Dry

Especially rugged and substantial. Nine-foot size weighs 40,000 lbs. Large shafts with bearings close to point of labor. Accessible adjustable step box. Extra heavy mullers and wear plates of hard white iron. All parts interchangeable. Repair parts always in stock and low in price.

Jackson & Church Co.

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Builders of a complete line of machinery for making Sand-Lime Brick. Boilers, Rotary Dryers and Kilns, etc.

SAY "I SAW IT IN" BRICK AND CLAY RECORD

Remarkable
Of Course!

The McManigal Superheating system burns Hocking Valley Paving BLOCK in 5½ days.

By using two crowns and a blower, the radiated heat from the inner crown was collected and fed back into the kiln thru the bed of coals. The burning time was shortened 25%, and the fuel required was approximately 70% of the usual requirements.

The block were thoroly burned from top to bottom—nowhere overburned—nor underburned.

HOCKING VALLEY BRICK COMPANY
Plants at Logan, Ohio

Logan, Ohio, December 15, 1915.

Mr. R. D. McManigal,
City.

Dear Sir:

We are pleased to advise you that the burn just made on your improved kiln using the McManigal Grateless Furnace and the preheated air appliances has resulted in quite a material saving in fuel—30 per cent and at least two days' time in the burning.

If at any time we can be of service to you personally, recommending your kiln to prospective buyers, we ask that you command us and should you feel at liberty to use this letter, we gladly give you that permission.

Very truly yours,

Hocking Valley Brick Company.

EA/SF

Edgar Angle, Superintendent.

Investigate and satisfy yourself now. The system should be installed on at least one of your kilns this winter—before spring opens. Address

The McManigal Grateless
Furnace Co.
Logan, Ohio

manency in their foundation is marked to the end that such roads will be ready for hard surfacing when the funds become available.—*Chas. E. Snyder, editor "The Farmers' Review," Chicago.*

Brick in road building has not been successful in Canada largely because of the two extremes of heat and cold seeming to favor a harder and more pliable substance than brick; tho a possible (and to some, a better) reason would be a lack of knowledge in the proper utilization of brick in road making.—*Frederick Wright, editor "Canadian Municipal Journal," Montreal.*

In these central states, there is a great opportunity for brick paving. When properly laid and properly filled, there is no doubt but that a brick pavement is one of the best investments which a city can make.—*Ford H. MacGregor, editor "The Municipality," Madison, Wis.*

The brick road has come to stay in our hilly country. It is the only material that will make a road on which horses can stand in icy weather. This, of course, refers only to roads that have some grade. Our highway officials have been experimenting with different materials and find that, while some of them are useful where the road is level, there is no use in trying to make a good, permanent hilly road out of anything else than brick.—*E. S. Bayard, editor "National Stockman and Farmer," Pittsburgh, Pa.*

The further development of the method of laying brick wearing surfaces on a mortar cushion instead of a sand cushion adds to the popularity of brick because it removes two or three of the objections which have been made to the results of former methods of laying, and makes a monolith of the brick and the foundation. This is particularly true when wire-cut-lug blocks are used. By the way, the rate of increase in popularity of this form of brick is one of the phenomena of paving history and has not been equalled by any similar invention in the paving field.—*Charles C. Brown, editor "Municipal Engineering Magazine," Indianapolis, Ind.*

Autos

In the motor car industry there is every present indication of boom times ahead. New factories are constantly being built and additions are being added to those already in service. Manufacturing concerns are making continuous preparations for an increased output. The effect of this upon the clayworking industries is likely to find its greatest reaction in the demand for brick-paved highways that will come from the constantly increasing numbers of motor car users in the country.—*A. C. Johnston, associate editor "Motor," New York.*

The extremely bad weather conditions during the past season have impressed upon the minds of good roads enthusiasts of the Middle West the necessity of something more permanent than dragged dirt roads. There is a general agitation thruout this section for the building of permanent roads—I mean actually permanent roads—not macadam or other unsuitable hard roads. In this agitation "The Motorist" has had its part and is urging the construction of a system of permanent roads. Those furthering this work favor either brick or concrete, the maojrity preferring brick, the lower initial expense being the only point to draw some to the concrete side.—*L. A. Higgins, editor "The Motorist," Omaha.*

Brick roads, when adequately maintained, certainly supply a pavement second to none. There is the greater initial expense, but this is offset in the exceedingly modest outlay in up-keep.—*A. G. Batchelder, editor "American Motorist," Washington, D. C.*

The automobile industry is just closing the biggest year of its history. All records have been broken for carload shipments from manufacturing plants. During the year ending June 30th, 703,500 motor vehicles were turned out by American manufacturers, which represents an increase of nearly 200,000 over the previous year. The exports of cars in 1915 (fiscal year) amounting to $60,000,000, represents but ten per cent of the value of the total output and it can, therefore, be seen that the demand for cars for the uses of belligerents in Europe has not stimulated the boom in the automobile industry as is sometimes thought.—*Julian Chase, editor "The Horseless Age," New York.*

Great extensions in all lines of the automobile industry during 1916 will involve the erection of innumerable new factory buildings, warehouses, garages and the like. Of these a great portion must necessarily be of brick, so that the automobile industry and the automobile trade may both be looked to by the brick and hollow tile industry for heavy orders during the coming year.—*Roy S. Drake, editor "Automobile Topics," New York.*

The motor car industry has been one continuous factor which has created a constant drain on the brick trade. New factories and additions to old ones, tens of thousands of garages and the stimulation given by automobile manufacturers and owners to the good roads movement have all had their effect. The phenomenal growth of the motor car industry during the past ten years has exerted salutary effect on the brick and clay industry.—*David Beecroft, directing editor, "The Automobile," New York.*

In this great automobile industry in which our country leads the world, there is a possibility of tremendous degree. On every hand there is a frantic effort to expand, to build up production, to perfect and to market a better product at a better price. New buildings cannot be constructed with speed great enough to please the powers that finance—new cars cannot, apparently, be produced with sufficient rapidity to please the people who buy and it is not alone the city man who, it is sometimes said, will sacrifice his property holdings and accumulated savings for the pleasure of automobile ownership, who is at the head of the buyers' list. Right at his side stands the farmer, the great American farmer who wants his new motor car, his farm tractor and other farm power machinery—and wants them badly.—*Thomas P. Hallock, managing editor, "Motor Mechanics," Cleveland.*

Of course it is obvious that as our line of trade is a very rapidly growing one, it has due influence upon many branches of the clayworking industry. Henry Ford alone is adding largely to the use of brick by the immense assembling plants which he is building in many parts of the country and there are about fifty of them now of concrete and brick construction and we have no doubt that this number will be largely increased in the future, as it is the policy of the Ford people to give the most direct distribution which it possibly can. The Ford Motor Company expects to manufacture about 500,000 cars during 1916 and you can see what the requirements are for garages, public and private.—*C. S. Palmer, editor "The Fordowner," Milwaukee, Wis.*

The condition of the automobile accessory business can be summed up in a few words: It is unusually good and will continue so as long as the European war goes on and the farmers of this country are prosperous. As for the farmers, they are achieving what is usually considered impossible; they are "eating their cake and having it too." They raise big crops and are getting big prices for them. When this large portion of the community is prosperous and there is a demand for the workers of the country, the first principles underlying good business are assured. For good business is made by a trinity—the desires and needs of the people and their ability to satisfy them.—*A. A. Hill, editor "Automobile Dealer and Repairer," New York.*

BRICK PLANTS
Are Installing
CYCLONE GRATES

Not only because they are sold on ninety days' trial, but principally because in practical every day use they have proven their right to these claims:

1. Even distribution of draft.
2. No fuel gets into ash pit.
3. Locks level.
4. Burns cheap fuel.
5. No fingers to burn off.
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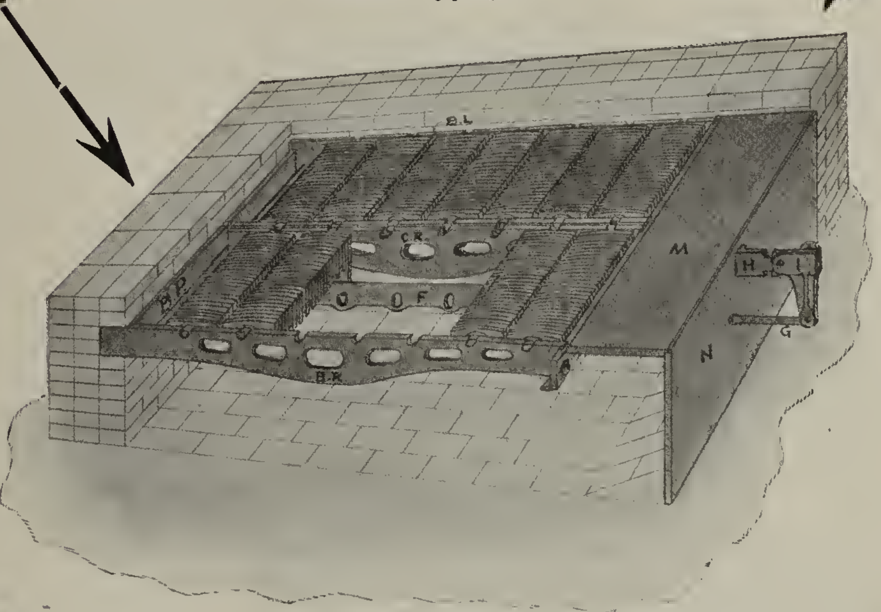
Isn't This the Kind of Grate You Want?



We can afford to sell the Cyclone Grate on 90 days' trial because of our confidence in our ability to make good on all our claims.

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BUFFALO, N. Y.

A Guaranteed

Hook System of Burning Clay Products

Will—

Reduce your coal expenditures.

Reduce your time of burning.

Will—

Decrease the number of kilns needed, and so lower the capital investment.

Because—

A Hook Kiln

burns any kind of ware in a shorter length of time, and it does it with less coal. A Hook Kiln can be and is TURNED oftener than other types.

Therefore—

This system will lower your running expenses, will increase your capacity, and the actual plant investment is greatly reduced—

—and we can prove it

Hook Patent Kiln Co.

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1916

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1916

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These machines are not in the cheap class—they are built up quality and will help you "Make and Save"—make more and better products and save delays and repairs.

Permanent economy in machinery is better than a temporarily cheap price. These machines are built for permanent profits and permanent friendship of customers.

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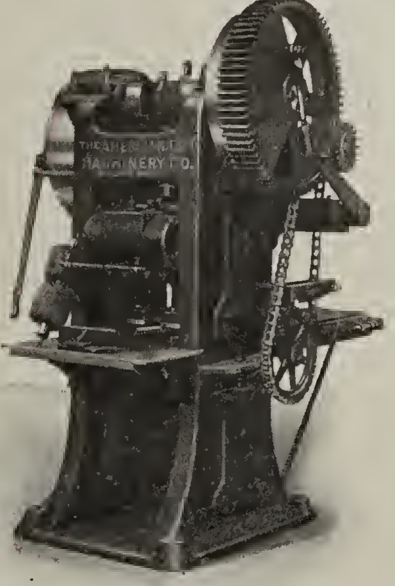

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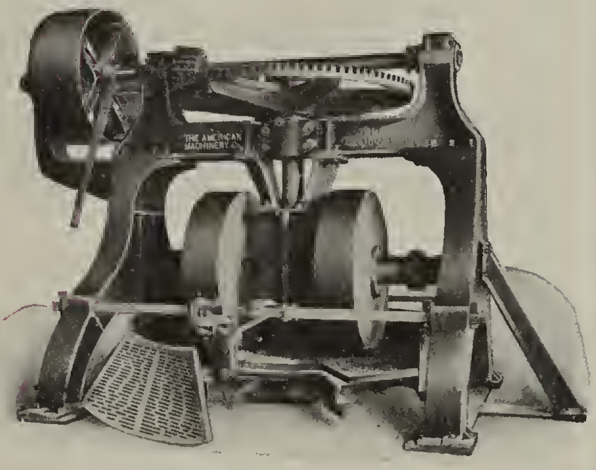

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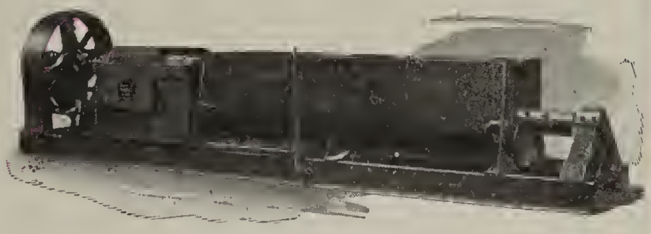

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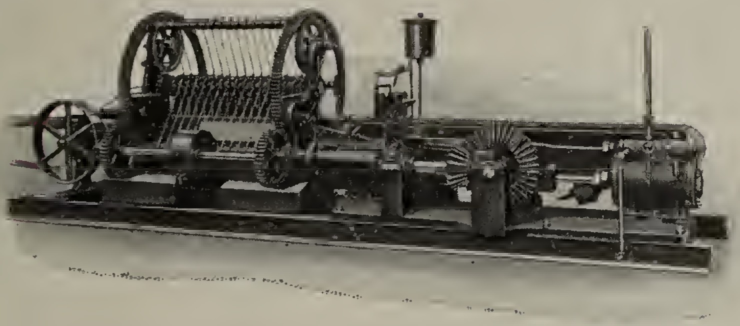

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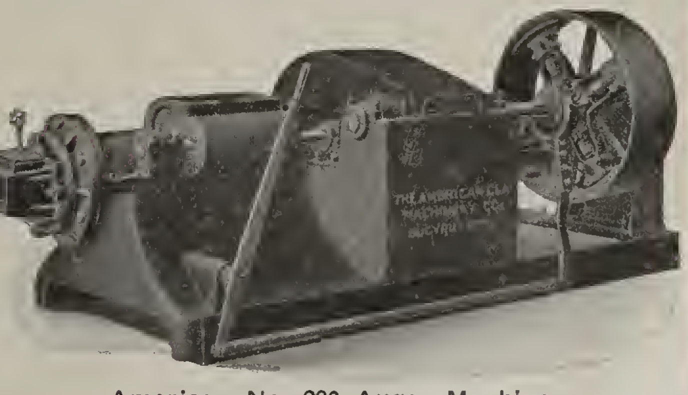
Machinery



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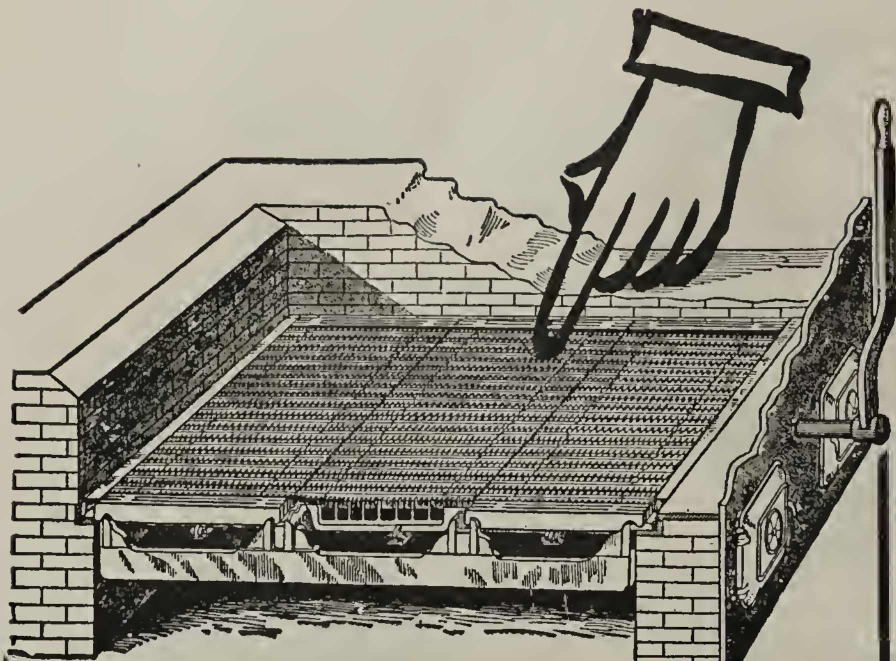

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Reduced cost of fuel—*burn any coal.*
More dividends for your stockholders.

These advantages are being accomplished by using

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The bars run **lengthwise** of the furnace—they **cannot** be left in position to catch the scraper when cleaning.

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They cannot break or warp due to unequal heat expansion.

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They are easily adjusted for any size of coal.

They are built for durability—averaging over 80 lbs. per sq. ft. of surface.

They are fool proof.

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A Brick Pavement that is Quieter

THE noisiness of brick pavement is to many property owners a great objection. This objection, however, is based primarily upon pavements the joints of which are filled with cement rather than with Paving Pitch.

The use of Paving Pitch for the joints largely overcomes this objection of noisiness.

Pitch is a non-conductor of sound. The pitch filled pavement does not echo and ring the way a cement filled pavement does, as the sound of the blow of a horse's hoof will not pass from brick to brick when every brick is surrounded with plastic, elastic Paving Pitch.

Cement filler transforms the brick into a single monolithic sounding board, whereas with Pitch Filler the only noise is that of the horse's hoof upon the single brick which it happens to be striking.

This is very noticeable in cases where a cement filled pavement adjoins a Pitch filled pavement—when a wagon passes from one to the other there will be a noticeable change in tone, the Pitch filled pavement being decidedly quieter.

Pitch also is better than cement as a filler because it provides adequately for the expansion of brick in hot weather.

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TRADE B MARK

MERELY debating the matter in your own mind will never enable you to understand the full measure of burning economy that is characteristic of the

Underwood Producer Gas Burning System

Patented

For Periodic Kilns

But if you will let us debate it with you, our arguments cannot help but turn you from a skeptic to a believer.

If you really are in the "doubting Thomas" class and must **see** before you believe, then why don't you investigate the matter fully by visiting one of the plants at which this system is installed and regularly operated and bringing to its users a saving that is astounding?

If you don't know how to reach these plants let us give you full directions.

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Everything for the Clayworker

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in drying brick are largely caused by *uncertain control* of the drying elements —heat, humidity and air circulation.

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Is it easily handled—does it clinker badly—does it give a long flame—do you get sufficient heat from it—does it burn flashy—does it give a steady heat—is it too expensive—require too many tons to burn a kiln?

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are the quickest acting, simplest made, easiest operated and most durable valves known.
All sizes for every purpose.
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BRICK AND CLAY PLANTS
Sure in its preserving and proofing quality.
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Clean, Economical, and Satisfaction Guaranteed.
Advise your requirements and kind of belting used, in letter today to
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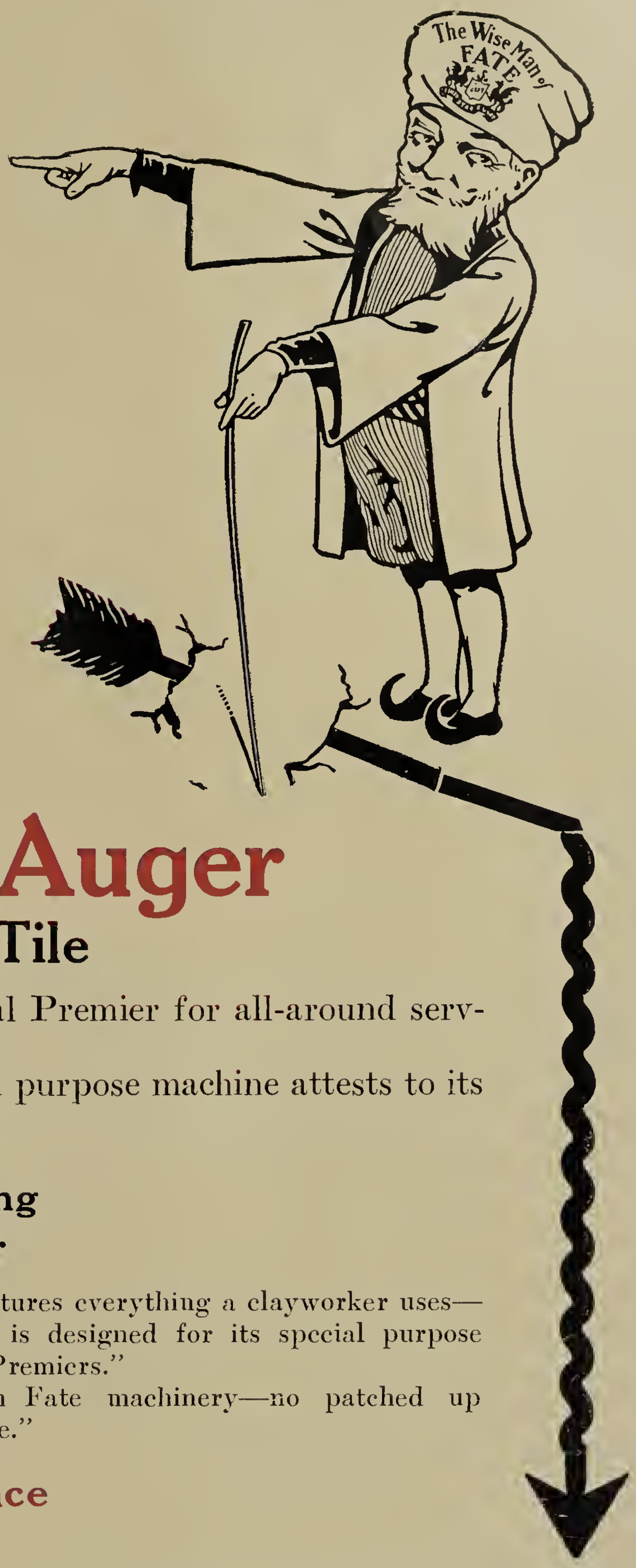
Here's a General Purpose Auger Machine That Will Cut Down Your Manufacturing Costs


The Wise Man of FATE

There are many clay plants that require a general purpose machine—an auger that will turn out the maximum of brick or hollow tile.

Those that need this general purpose machine can get full efficiency in

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For Brick and Hollow Tile

There is no auger made today that will equal the Fate Special Premier for all-around service and absolute dependability.
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Town .... State..............

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A Monthly Publication Filled with Motor Truck Facts and Figures

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It's different from the ordinary "house organ." It is one of the most interesting motor truck publications of the day. It is devoted to facts and interesting items concerning motor trucks in general.

It will be well worth your time to spend a half an hour once a month reading "Like KELLY Does." There is a big field for a publication of its sort and "Like KELLY Does" is the leader.

It started three years ago as a four-page publication with a circulation of 12,000. Our January, 1916, issue contained sixteen pages in color and 40,000 copies were printed in English and 5,000 in Spanish.

If you are interested in finding out all you can about motor trucks we will be glad to send you "Like KELLY Does." Your request to be put on the mailing list will obligate you in no way.

May we send you this interesting little book every thirty days?

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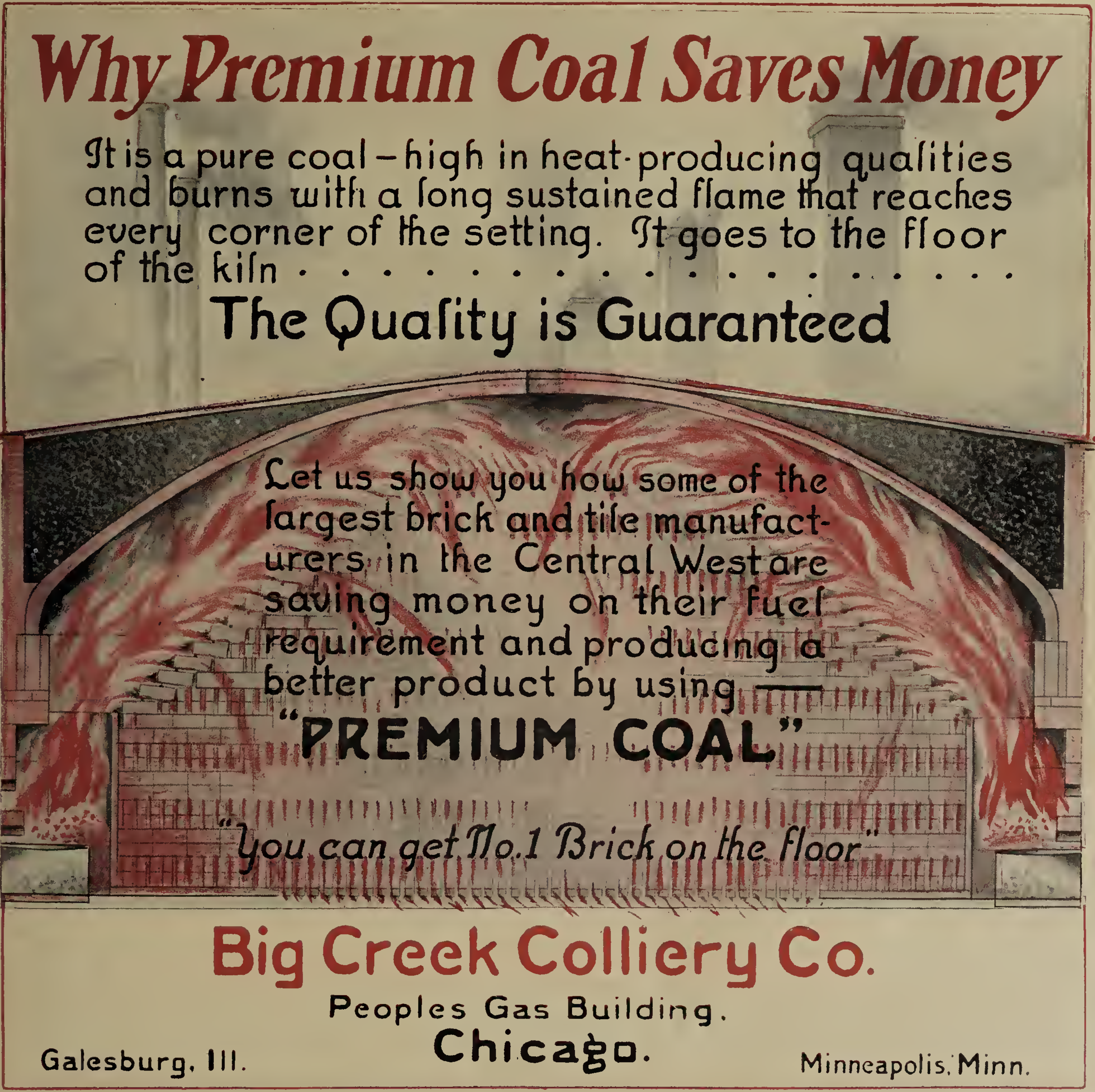
The Kelly-Springfield Motor Truck Company

1401 Burt Street **SPRINGFIELD, OHIO**

BRICK and CLAY RECORD



Why Premium Coal Saves Money

It is a pure coal—high in heat-producing qualities and burns with a long sustained flame that reaches every corner of the setting. It goes to the floor of the kiln . . . .

The Quality is Guaranteed

Let us show you how some of the largest brick and tile manufacturers in the Central West are saving money on their fuel requirement and producing a better product by using —

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"You can get No. 1 Brick on the floor"

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Vol. XLVIII, No. 2 Chicago January 18, 1916

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How Much Does It Cost?

Every Brick Yard That Burns Coal Will be Interested In This —

—The cost of unloading coal from cars into storage piles or carts.

—The cost of rehandling from storage to carts or barrows.

—The loss of coal falling on the ground and being ground into the earth.

—The loss of time while the wagon or cart is standing idle.

—The loss from thefts, a big item in many places.

—The loss in heat units in exposure to the weather.

¶ In the next issue of Brick & Clay Record we are going to tell you how an enterprising clay working plant got busy to solve this problem

In the Meantime—study your own proposition and see if there are any leaks around your plant that should be plugged. We can and will gladly help you.

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SAY I SAW IT IN BRICK AND CLAY RECORD

BRICK and CLAY RECORD

A Semi-Monthly Record of the World's Progress in Clay-working

Published on the First and Third Tuesdays in Each Month by the

Kenfield-Leach Company
445 Plymouth Court,
Chicago

Cable Address Kenleaco, Chicago

Telephone Harrison 951

Chicago, January 18, 1916

Vol. XLVIII No. 2

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Entered as Second Class Matter January 2, 1911, at the Postoffice at Chicago, Ill. Under the Act of March 3, 1879

Terms of Subscription:
One Year, (24 Numbers)
U. S. . $2.00
Foreign 3.00

All Subscriptions Begin With the Number Last Issued When Subscription Is Received

Single Copies, 20c

The Editor's Corner

Comment, Criticism and Advice on Live Issues Affecting Clay Products and on Their Uses, Sale and Manufacture

ALTHO the shipping season is over and building operations are, for the most part ice-bound, the man who owns a clayworking plant finds a great deal to keep him busy at this time of year.

If he has been among those who took time by the forelock, he is installing the new machinery and testing out the new kilns and new drier that he contracted for two or three months since. If he has waited for the yearly balance sheet and the annual stockholders' meeting before making the much needed improvements, he is wondering about his ability to get deliveries and how much longer he will have to wait for steel.

Reports that come to us from all parts of the country tell of resumption of good business two or three months ago—orders that kept coming in at satisfactory prices, until the cold weather stopped shipments. The "Year of Promise" fulfilled the prophecies that were made for it—only it was a little slow.

One of "Brick and Clay Record's" advertisers said, a few days ago, "If the first ten days in January are any indication of what the balance of the year will be, there will be a complete revolution in the clayworking field before Nineteen Sixteen has closed. Plant owners are spending money—big money—on improvements. They are asking questions about costs. They are cutting out the waste. By the end of the year, the cost of manufacture will be reduced to a point where, if selling prices are maintained, clay products manufacturers will be rolling in money."

There is no doubt of the truth of what he has said. Day after day, letters come to this office, asking for information as to the cost of various processes of manufacture. The man who used to be content with what he believed to be his cost, has made a study of it, with the result that he now knows, what before he merely guessed. And his newer knowledge has taught him that he is wasting money.

In many branches of the clayworking industry, the wage scale is notoriously low. The intelligence of the average clay-plant laborer is indicated by a dent, rather than by a bump on his cranium. Antiquated machinery, poor power transmission, leaking, bulging, tumbledown kilns, badly roofed sheds and flimsy, frame structures are the rule, rather than the exception.

There is a lesson in the fact that the plants which placed orders for new equipment last October and November, were the plants that had fairly good machinery, and driers and kilns and sheds, all during those two or three bad years that are now, fortunately, past history.

Despite the fact that building "fell off" and "prices were bad"—these better-built plants made money. They made so much money that they had enough to go ahead and improve, and they will reap the harvest that is waiting.

The man who stayed in business and lived from hand to mouth, by the simple process of not spending a cent that he was not forced to spend, has a bad proposition on his hands.

There is his plant—worth less by a whole lot, than it was, two or three years ago. He has made a product, and sold it. The price, perhaps was fair—as fair as anyone else asked. But where are his profits? Where is the amount he needs, today, to place him in the running with his competitors?

A little "looking backward" over the record of "days running" and "days shut down" will tell an interesting story. A look at the repair bills, none of them large, perhaps, but in the aggregate a deal of money, will be of some help. The "spoiled ware" record—the overburned or underburned kilns—all did their part.

Those are things to bring up at the annual meeting. It may not explain why the dividends were so small—but it will show why they will continue to be small, no matter how good a year Nineteen Sixteen is going to be,

The Editor's Corner

nor how great the demand that is promised for what you are making.

The Price That Pays

Much has been written in these columns, and much more will be written from time to time, about the fallacy of letting "the other fellow" make your selling price. This has to do as much with the man who makes one clay product as another.

The buyer seldom, if ever, has a fair idea of values. Knowing this, he pits his ability to buy against your ability to sell. The shrewd buyer "beats you down" to bed-rock, and with less reason than you have for maintaining a profitable price.

You know what your product costs you. If you don't, it is time you spent the time and money it will cost you to learn, knowing that whatever you do spend in this way is a safe and sure investment.

You know what your product is worth, when compared to a similar product, or to a product that tries to serve the purpose for which yours is sold. You start, then, in the argument that leads to a sale, much better equipped than the man who is doing the buying.

If in answer to his question, you can say "My product costs me more to make, and is better made" than the product that he says he can buy for less money, you have an argument against which he cannot make much progress.

If you can tell him that your service is perfect—that you believe in following your material thru to the place where it is used—that you do your own car-tracing, and take a pride in keeping your customers—you are selling your product, not meeting a price.

The lines that have been written, regarding the lowering of costs, have not been with a mind to the lowering of selling price. The lower your cost, the greater margin between what you spend in making and what you gain in selling—and that margin belongs to you.

Find out what your product costs you—work unceasingly to lower that cost. Know what your product is worth, and make a price that is fully up to that worth.

Then stick to the price you have made, supporting your position by every selling argument that you can properly use.

This Nineteen Sixteen year is going to be one of demand. The buyers will pay your price, if you stand out for it—pay it with much more confidence in your fair dealing if they know that you will not cut.

The successful industries of the country—manufacturing and retailing—are splendid examples of the "one price policy." The store that marks its goods in plain figures, instead of the fast disappearing ciphers, is the store that we most often patronize.

When we want to buy something that we are not altogether sure about, we go to the store that has the reputation for a standard—and generally a high—price.

What is there about some of the more important clay products that makes their bartering a transaction that scents of the ol' clo's man and the Oriental rug merchant?

Mixed Ethics

The architect, like the physician and the lawyer, does not advertise. That is, his "ethics" forbid his doing so, and to patronize the advertising columns of any journal puts him outside the pale of architectural good society.

He expects, however, that every time any manufacturer of brick, or lumber, or cement or any other building material or accessory, inserts an advertisement in which the picture of a building appears, that the name of the architect of that building will be given.

The same thing is expected, in the case of an illustrated story, and architects are not at all averse to giving facts and figures on certain very attractive buildings, in consideration of their names being mentioned—as frequently as there are illustrations.

Yet, when some publication sees fit to devote an entire issue to the work of some more or less prominent architect, this ethical professional gentleman is not above writing to a number of prominent manufacturers of brick and other building materials, saying that he will appreciate any advertising patronage that they may be willing to give that particular issue of that none-too-particular publication.

It would look to the man who sits on top of a wall, as tho the architectural "ethics" were a bit mixed.

The HOUSE of HAPPINESS

A BUNGALOW BUILT OF BRICK IN CHICAGO

The Colonial Doorway and Pergola

MY EXPERIENCE as a home-builder is pretty well known to all of my friends. I talked so much about it—and wrote so much—while I was building and after I had moved in, that everyone who knew *me,* knew that I had built a brick house, and that I had been rewarded for the care I had taken in selecting my face-brick.

In fact, the story found its way into print. As a consequence of that, and of some rather incautious things I said—and wrote—about face-brick men, some of those who felt they knew me well enough to plague me, were led to ask me why I didn't *marry* a brick man, and take him into my brick home, there to bill and coo and *talk brick* until death should us part.

I suppose every girl has some ideal. I am sure that, in my search for the right brick with which to build by "nest," I had not seen any one at all like the "right" man. But when I was asked, so many times and by so many girls, why I didn't "marry a brick man and be done with it," I began to sort of look around a little, and prepare myself to answer the question—that is, why I did *not.*

It required somewhat of an imagination you may be sure. In the first place, no brick man had expressed any desire to share my modest home and still more modest fortune. Then too, as I have already said, altho I had met a number of brick men—more of them, possibly, than I had ever met in any other single line of business—none of them had started me to thinking—and there you are.

So, carefully concealing my real purpose, I made an effort to meet as many brick men's wives as I could. From them I felt that I could learn whether the better half of brickdom was any happier than those who shared the names and incomes of, for instance, lawyers, literary men and bank cashiers.

Whether these "brickettes" had a canny idea of my object or not, is more than I can say. Maybe they feared I had designs upon their husbands, or sons, or brothers-in-law. Whatever the reason, they laid before me the most sorrowful array of facts that it had ever been my lot to hear.

The Living Room and Brick Fireplace

Almost without exception, they complained of stinted incomes. They told of the "good year" that was always coming, but never came; of the awful inroads that cement had made upon "the business" and of the constant trouble of one kind or another that seemed to be a part and parcel of the operation of "the plant."

More than one whispered of the loathing in which she held the house in which she lived—a house built on the ugly lines that represented the absolute nightmare of some village architect (who had to be engaged, lest he retaliate) and faced with some hideous brick, because that brick was the only one made in her husband's plant. This complaint, in most cases, was from some woman who had been born and brought up in an old-fashioned, white-painted and green-blinded house, of good Colonial lines—wood, to be true, but to her the ideal dove-cote.

"But, my dear," I said, "there are lots of pretty brick to be had, and it's your house—wouldn't he let you buy what you wanted?" You see—I am a fixed convert to brick construction, myself, and I perfectly understand why her husband wouldn't let her build a wooden house.

By Louine Worden, Author of "Buying Face Brick"

The Window Boxes of Futurist Design

"And make his house an advertisement for a competitor's brick?" she answered. "I guess not!"

What did it matter that the same brick faced every livery stable in town? What was that against the chance that someone would say that her "hubby's" brick wasn't good enough to face the best house in the world?

Still, with all of this, I could see that some of the brick men who were the husbands in question did make very respectable incomes, and I couldn't answer the matrimonial question in the negative—*merely because they built brick houses and used their own brick.* And, besides, I had built my house, and had my own sweet way about it. Catch anyone trying to make me sell it!

So, my brick manufacturing friends' wives being worn out—that is, "interviewed" to a point where they openly were suspicious—I began to do some questioning among the wives of men who sold what the other men made. And it was here that I found another story. Searching for a happy home, I found a happy house—that is, a happy combination of architectural design, of artistic material and—I suppose this is very important, very low cost. I found a woman living in that home, and loving it.

She is the wife of a face-brick salesman.

I knew she was used to living in a home. I knew, without her telling it, that when she found she must live in the city in order to be near her husband's work, she drew the line at living in an apartment. It could be endured—its varied noises and intimacies borne for a time—but there would be, ever and always, the insistent desire for a place that was all her own—a home. I knew—she need not have told me—of the days that were spent in lot-hunting—the fitting of the many "musts" of good transportation—good air—good space for many, many flowers—into the "can" of that infinitesimal bank account and growing (but still limited) income.

I could see the two heads, bent over the great sheets of wrapping paper, as they planned the general plot of the interior. The rooms must all open together, first to save extra steps and to give the appearance of greater space. How, with painstaking care, and much rubbing out, each and every window was placed in that crude sketch; how door openings were allowed (with much figuring, to reduce feet to quarter-inches) with an eye to the remaining wall space for certain large pieces of furniture that they *must* have—or be out of fashion. Had I not done it all—myself? All, except that mine was a lone head—there wasn't any "he" in my plan.

So, when that happy brick man's wife—or happy wife of a brick man (for both live there) told me how they had planned to make their home have every mark of a house costing in the tens-of-thousands, and yet coming as close to the five thousand mark as was humanly possible, I understood. And I also followed her, in fancy, and nodded, when she told me of how they had taken the precious wrapping paper plan to the architect, and told him to look out for closet room, and to keep the windows low and broad, and all of the lines simple.

With sympathetic understanding I listened, as she told me of the changes they wanted to make in the architect's first sketch—the dormers—the band-courses, the pattern brickwork, and all;

THE COST WAS LESS THAN FORTY-FIVE HUNDRED DOLLARS

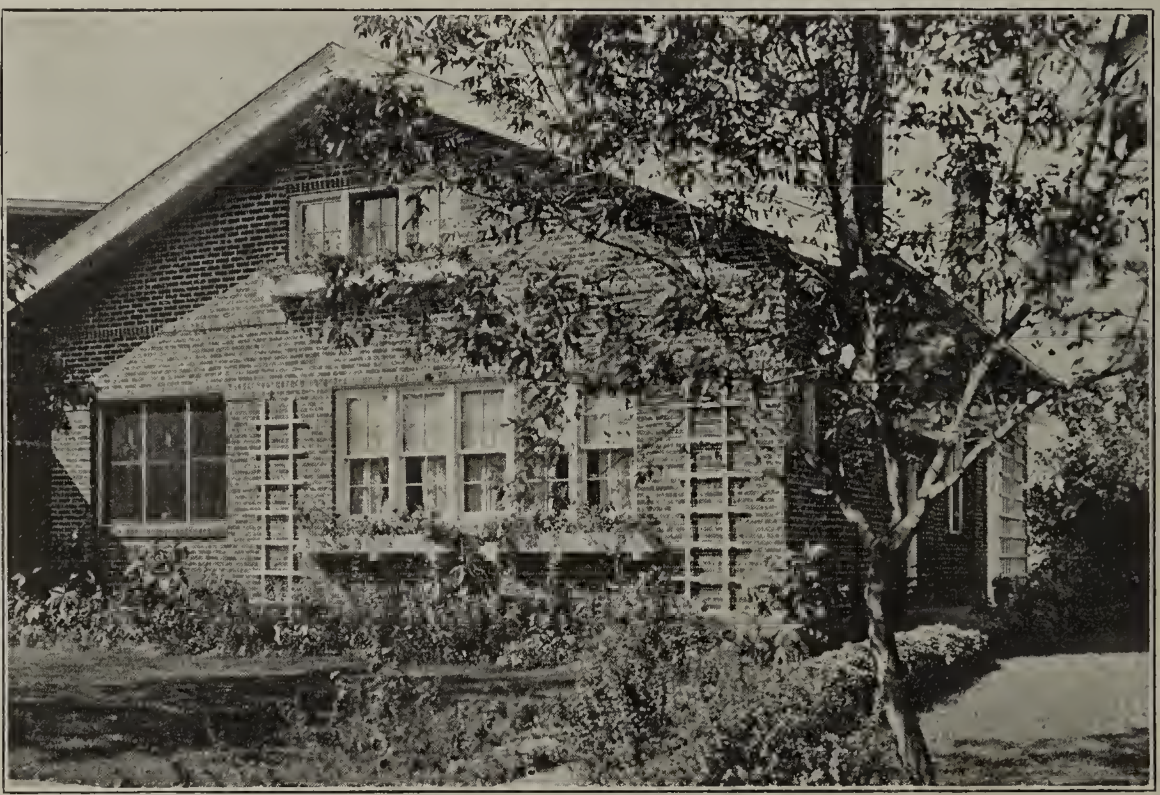
The Winter Sun Parlor and Summer Porch

and how they had to give some of them up, on account of the extra expense. How, too, they had pitted their desire for a lovely home against the conservatism of the architect, who had always built along certain lines, and felt that any change would hurt his dignity.

Well—the home builders won. I nearly put a damper on the enthusiastic recital by asking her how they had come to build with brick instead of the "dear white clapboard house surrounded by hollyhocks." It was in my system, and I had to get it out. But I am sure I should have left in mad haste, had she told me that her husband had insisted upon brick because he was in the brick business.

But what I got was the most plaintive "Oh, don't you like the brick? We think it is beautiful." Indeed I did like it, and hastened to assure her that I was much relieved that the exterior, as well as the lines and the plan, were matters of choice, and not of compulsion.

She looked at me for an appreciable moment—much as one looks at the *other* singer, when an off-key note is sung in a duet, and then, lifting her "perky" morning cap to allow an insistent wavy lock to get out for breath, she went on to tell more of the fun of building a brick house for one's very own.



"The House of Happiness"

"When we bought our lot, there were no houses on either side of us, for two hundred feet. Since then, they have fairly sprouted out here. And I am sure that, even if those houses have been built since, you will agree with me that ours looks as tho it were just completed—that it looks newer than the rest. You see, some of the things I did not understand or know about, my husand did. He knew that by using a white mortar joint with a warm, rough brick, we could produce that effect of freshness and yet preserve the soft color—the velvety tone of the brick."

They had succeeded. Perhaps some of it was due to the fact that her husband knew "some of the things" that she "did not understand or know about"—I guess he knew some things that a lot of people do not understand—or know about.

When the architect had finished the plans, that brick man husband obtained the men he *wanted* to carry out the specifications. He let his own contracts for carpentering, heating, masonry and what-not. When the excavators began to dig that they might build, the two spent the twilight hours looking into the trenches and "visioning" the walls that were to grow in those furrows. As the "planting" sprouted, things did not look, in some cases, at all as they did on paper. Occasionally, when it came to brickwork, changes were made, even against the disapproval and advice of the mason. The plans called for two brick steps leading to a little platform before the doorway. Around this was built a small brick wall. The effect was not good—looked "stingy"—out of keeping with the generous lines everywhere else. It was torn down, and instead, a charming, white pergola effect was built as a dressing for the doorway and white marble steps were laid, leading to it.

The outer door—very white and very simple—with Colonial lines and Colonial hardware, opened into a vestibule about four feet square. A rise of two steps in this led you into the hall—if it could be called a hall. It seemed to merge into the living-room, the dining-room and be a part of the chamber.

To the front was the living-room, at one end of which was a brick fire-place (which, by the way, was a *real* fire-place, that might burn cheery logs)—that, and the built-in bookcases formed the end of the room. Over each bookcase was a low window. The ceilings were low, and to carry out this line, a wide rail followed the top of the door and the window openings around the rest of the room. Five small windows, of eight panes each and set close together, looked over gay and unusual flower-boxes.

French doors at the south end of the living-room opened on to the porch, which in winter (by replacing screens with windows) made a charming sun-room. This porch was about thirteen feet long and eight feet wide, and helped to give the effect of a very much larger living-room

The woodwork in the living-room and in one chamber was birch, with mahogany finish. The dining-room was finished in silver-gray oak, with cool, gray grass-cloth wall coverings.

At the back of the house was the larger bed-room, with two low windows looking out on a forty-five-foot yard of smooth, green velvet, surrounded by rows of gay and giddy plants of all kinds and colors, backed up against a white lattice fence. The city seemed miles away.

But to come back to the house—such a closet that graced that bed-room! The whole end of the room cut off—two doors leading into it and a window all its own!

The kitchen, finished in natural birch, was a marvel of compactness and convenience. A large window over the generous sink made it impossible to grumble at having to do the humblest task. For how can anyone be cross when a splash of scarlet grows amid green leaves right before one's eyes and, hanging high, a cage with a bit of yellow fuzz, singing his very heart out, for you?

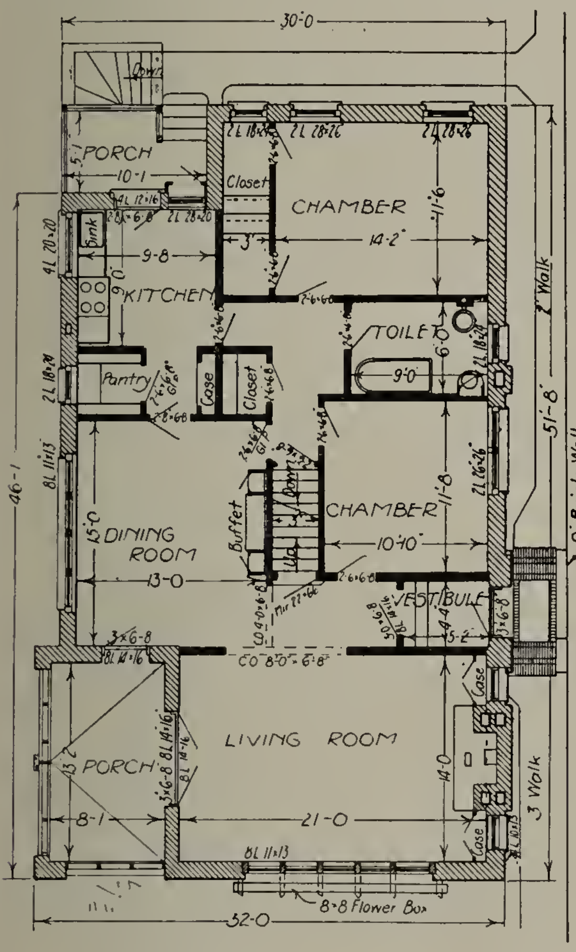
The bath-room had two points that impressed me—first, absolute whiteness with mosaic tile floor; then, the fact that the tub was not under the window to catch every grain of smudge that came in from the neighbor's chimneys.

The basement was given over to the usual laundry, coal-storage and other uninteresting things. But at the front of the house was a room that soon will be a wonderful man's room. Perhaps he will call it a billiard-room. The husband not only believed in brick to make his home "safe and sane" and beautiful on the outside—he knew that brickwork could be made a thing of beauty. So a fire-place in this room not only fills an entire wall, but extends over two other walls—lining the room with brick, or, as one might think, with a great, coarse-woven burlap that was made to endure time and frost and fire and flood by a period of burning in a furnace much more fiery, I am sure, than that endured by Shadrach, Meshach and Abed-nego.

And then, above the main floor was another floor with low, sloping roof and dormers, that in time might become very interesting—it seemed full of possibilities—even as a stork's nest. A little garage, built at the very farthest corner of the lot, but with the lines and the color and the *brick* of the house completes the picture.

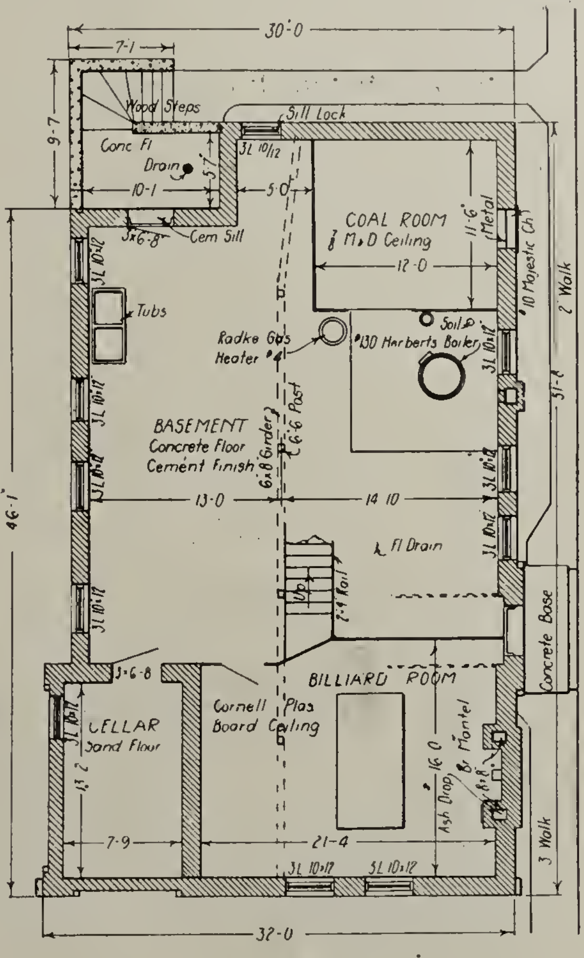
And the cost—by watching all of the details, being "on the job" and shopping a bit to get the right materials at the best prices—and knowing what the best things were (that is very important) was approximately $4,400. That is the cost of the *house*—not including the lot. Property has gone up so rapidly that one only tells what it *sells* for—today. What it *cost*—yesterday, is a sealed book.

The "House of Happiness", built in Chicago, cost $4,378, the money going about as follows:



First Floor Plan

Architect	$ 50
Excavating	30
Carpentering	1,480
Glass	57
Brickwork	1,330
Electric wiring and fixtures	76
Roofing (asbestos shingle)	115
Heating	300
Plumbing	300
Painting	165
Garage and miscellaneous expenses	475
Total	$4,378



Basement Plan

Notices have been sent to all clayworkers in the Northwest, giving the date and place of holding the eighth annual convention of the Northwestern Clay Association, of which F. B. Martin is president and L. G. Rose, secretary. The dates are January 20 and 21, and the place, Minneapolis, Minn. Headquarters will be at the Hotel West. A convention of lumber dealers operating in the same district will close its sessions the 20th, and this will enable the clay products men to meet with their several agents and representatives without having to make an extra trip.

A very fine program has been outlined, and questions are coming in for the "Question Box"—an institution that has made past conventions of the Northwestern Clay Association notable. The box will be opened before the first session, and is expected to produce subjects that can be discussed both on the first and second day.

Coming Conventions

Jan. 18, 19, 20........Canadian National Clay Products Association........King Edward Hotel, Toronto, Ont., Canada.

Jan. 20 and 21........Northwestern Clay Association........Hotel West, Minneapolis, Minn.

Jan. 25........Hollow Building Tile Mfrs. Assn. of America........Hotel McAlpin, New York, N. Y.

Jan. 27 and 28........Wisconsin Clay Manufacturers' Association........Republican House, Milwaukee, Wis.

Feb. 3 and 4........Iowa State Clay Products Mfrs. Association........Iowa State College, Ames, Iowa.

Feb. 8, 9, 10........Illinois Clay Products Association........Hotel Jefferson, Peoria, Ill.

Feb. 9 and 10........Oregon Clayworkers' Association........Hotel Albany, Albany, Ore.

Feb. 17, 18, 19........National Builders' Supply Association........Hotel Statler, Cleveland, Ohio.

Feb. 21 to 24........American Ceramic Society, Cleveland, Ohio.

Feb. 21 to 26........National Brick Manufacturers' Association........Hotel Statler, Cleveland, Ohio.

Feb. 22 to 25........American Road Builders' Assn........Pittsburgh, Pa.

Feb. 23 and 24........Western Ontario Clay Workers' Association........London, Ont.

The Western Ontario Clay Workers' Association will hold its 1916 convention in London, Ont., February 23 and 24. It has been decided to enlarge upon the territory previously covered by this association and invitations will be sent to clayworkers operating in the Huron, Perth, Oxford and Norfolk districts as well as to those in the territory previously covered by the Western Ontario Clay Workers' Association, which were Elgin, Middlesex, Lambton, Kent and Essex Counties. The place of meeting which, as before stated, is London, Ont., was chosen as the most central city, being easily accessible from all of the several counties. Strenuous efforts have been made to secure the attendance of at least one representative from every clayworking plant in western Ontario. Letters that have come to the secretary indicate that his endeavors in this direction have met with a ready response, and that a thoroly representative attendance may be relied upon.

The annual convention of the Oregon Clayworkers' Association will be held at Albany, Ore., February 9 and 10. Headquarters will be at the Hotel Albany. Correspondence in connection wtih this convention should be addressed to S. Geijsbeek, 604 Blake-McFall Bldg., Portland, Ore.

Worth While Papers at Iowa Convention

An advance copy of the program for the coming convention of the Iowa Clay Products Manufacturers' Association, which will be held at Ames, Ia., January 31 to February 5 inclusive, discloses some very attractive subjects and equally prominent speakers.

A. V. Bleininger, of the Bureau of Standards, and director of the ceramic department of the University of Illinois; Charles F. Binns, director of the New York State School of Clayworking and Ceramics; Dr. G. C. Mars, director of the Department of Service of the Hydraulic-Press Brick Company; H. W. Wagner, mechanical engineer, connected with the Iowa Engineering Experiment Station at Ames; M. P. Cleghorn, of the department of Mechanical Engineering, Iowa State College; Matt L. King, secretary Permanent Buildings Society; Dwight T. Farnham; Homer F. Staley and a host of others, are scheduled for as many papers—some for two or three.

A special appropriation was made by the Iowa legislature, in order that the college might have a fund available for the purpose of attracting to this convention and institute, speakers and ceramists of national repute.

On Wednesday, February 2, will be held the business sessions of the Permanent Buildings Society, of which Matt L. King is secretary. It might be said in this connection that a number of short courses on farm subjects have been arranged for the week beginning January 31 at the Iowa State College, at Ames, among these being one on farm buildings. Permanence will be the keynote of this particular course, the college presenting this question in no uncertain terms to the two thousand farmers that will probably attend. Mr. King has been intimately connected with the work of the college in the past and will do his part in the lectures which he will deliver to drive home the fact that permanence means burned clay. If weather conditions permit, an exhibit of permanent building materials will be erected upon the college campus, in which clay products will play an important part.

Farm drainage will also have a prominent place in the week's program, one course being devoted to this subject.

No Reproduction in Black and White Can Give More Than an Idea of the Beauty of this Calendar, Which is Being Distributed by the Thomas Moulding Brick Company, of Chicago

Ceramic Society Issues 1915 "Transactions"

Volume XVII—the 1915 edition—of the Transactions of the American Ceramic Society, containing the papers read at the meeting held at Detroit, Mich., Feb. 15-18, 1915, together with supplementary discussions, has just come from the press. All members of the society who are not in arrears have doubtless received their copies by this time if the addresses in the secretary's possession were correct.

The volume is the "biggest yet"—816 pages. This number of pages have been exceeded in the past but the editing of this book has, it is believed, condensed more matter into it than in any preceeding volume.

As already announced, the eighteenth annual meeting of the American Ceramic Society has been set for February 21-24, 1916, at Cleveland, Ohio. Heaquarters will be at one of Cleveland's leading hotels, final selection not having, as yet, been made. Due notice will be sent to the membership and will also be announced thru the columns of this magazine. At this meeting ballots will be taken on nominees for president, vice-president, secretary, treasurer and one trustee. Ballots will also be had on ten associate members who have been regularly nominated for promotion to active membership and approved by the Board of Trustees.

Second Calendar Crop Rates High

Since our last issue, several very fine calendars have arrived, one of the most notable being that issued by the St. Anne (Ill.) Brick and Tile Company; this is a perpetual calendar with a large numeral, and is surmounted by a white tile. The Thomas Moulding Brick Company's calendar, a reproduction of which is shown herewith, is a splendid example of the art of printing, as is also the calendar that came from the Corry Brick and Tile Company.

The Coral Ridge Clay Products Company, of Louisville, Ky., has issued a very artistic celluloid backed blotter, with the "three wise men of the East" on camelback, and in color. Naturally, they point to the fact that wise men all build with——guess whose——brick.

DIES *for* HOLLOW WARE

Many Brick Manufacturers Are Considering Changing Over to Make Hollow Tile. Here Are a Few "Do's and Don'ts" That Will Prove Valuable

By A. F. Greaves-Walker

Author of "The Design and Construction of Down Draft Kilns," "Setting Down Draft Kilns" and "Running a Plant to Capacity"

A FEW YEARS AGO, the average clayworker — or brickmaker — was not at all interested in the subject of hollow ware. Its manufacture was confined to comparatively few companies and what little knowledge on the subject that a few men possessed, was securely locked away and labeled "Trade Secrets."

As has often proved the case in industries other than clayworking—and, for that matter —in clayworking itself—these "secrets" contained so little real information as to be worthless to the industry at large; and so today, this important and rapidly growing line of clayworking finds itself attempting to progress with less basic knowledge, probably, than any other branch of the industry. For this reason, if none other, the matter of die construction and die adjustment has been brought into the limelight and an insistent demand for more knowledge is apparent.

The hollow ware manufacturers have made some progress during the past year or so, in fact, so much progress that literally hundreds of brickmakers have been tempted to "try their hand at the game." *It is these brick manufacturers, who for the most part, have taken up hollow ware as a side line, who are suffering most thru lack of knowledge on the subject of dies, or rather the lack of knowledge on the entire subject of hollow ware manufacture.*

Naturally, the simple thing to do when the decision is made to turn out a small tonnage of hollow ware, is to convert the brick machine into a hollow ware machine by simply buying a few dies constructed so as to fit the front of the machine. *Right here the trouble commences,* for a brick machine and a hollow ware machine are alike in appearances only.

Brick machines are built with taper barrels or fronts. This taper is designed for the express purpose of compressing the clay into as solid a mass as possible, in order that a dense bar may emerge from the die. In addition to tapering the barrel, in order to get the maximum bar density, the pitch of the auger in the nozzle is only increased enough to keep the area constant. This increase in the density of the clay is only prevented from doing injury to the barrel front or die, (or else relieving itself thru the hopper), by the fact that a brick die presents a fairly large opening—roughly forty square inches.

In reviewing the history of the tile industry it will be found that for years all hollow ware was made on sewer-pipe presses. As is well known these presses are straight barrelled affairs—they have no taper in their entire length. This fact, and also the fact that the clay was pushed thru the die by a plunger, which gave a perfectly equal flow over the entire surface of the die, made them absolutely ideal hollow ware machines in this respect. Their one great drawback was the intermittent delivery.

When the demand came for increased capacities, the auger machine was resorted to. Observation soon disclosed the fact that the webs of tile made on the sewer-pipe press were of sufficient density for all practical purposes and that therefore previous compression in a tapered machine barrel was unnecessary. In addition it was soon found that in attempting to force the compressed clay thru the limited openings of a tile die, the dies and machines were frequently smashed, an excessive amount of horsepower consumed, and, most annoying of all, the clay frequently insisted on backing out thru the hopper in preference to going thru the die.

These observations led to the development of the modern auger hollow ware machine. This machine has a straight barrel, generally a continuous screw auger, the pitch of which is constant or increases toward the front, and a force feed attachment. Sometimes instead of the force feed, a pug-mill is attached which serves the same purpose. This machine does not compress the clay in any way except in front of the auger. The auger merely solidifies and expresses it to the die opening, giving at the same time the greatest speed with the least possible consumption of power.

The differences between the brick machine and the tile machine, altho seemingly slight, are really great, in fact, great enough in many cases to make the difference between success and failure.

Of course, considerable hollow ware is made on ordinary brick machines, but when they are used, the many troubles which are encountered when even the most perfect equipment is used, are magnified a hundred-fold, and what is more important, the user is losing the benefit of all the work and investigation that is at present going on in the effort to eliminate the troubles of this branch of the industry: For it is obviously impossible to get investigators to spend time experimenting with machines which they know to be unfit for the work required.

That successful die construction and adjustment is not confined to work on the dies alone, the writer will attempt to point out in the following. The fact is, so many other items enter into the consideration, that the die might almost be considered as of secondary importance. Many clayworkers have spent months and even years and wasted thousand of dollars in experimenting with dies, *only to find that all of their trouble came from other sources,* which were overlooked because they were not understood.

On the other hand, adjusting a die so that it runs out ware that dries and burns safely is not enough. "Tonnage" is the cry in the tile industry, and *"tonnage" must be gotten.* It is therefore necessary to so build and adjust the dies that the greatest possible column speed may be reached. Many dies are built which will "run" successfully at a low speed, but when an attempt is made to get any respectable tonnage out of them, they are absolutely useless.

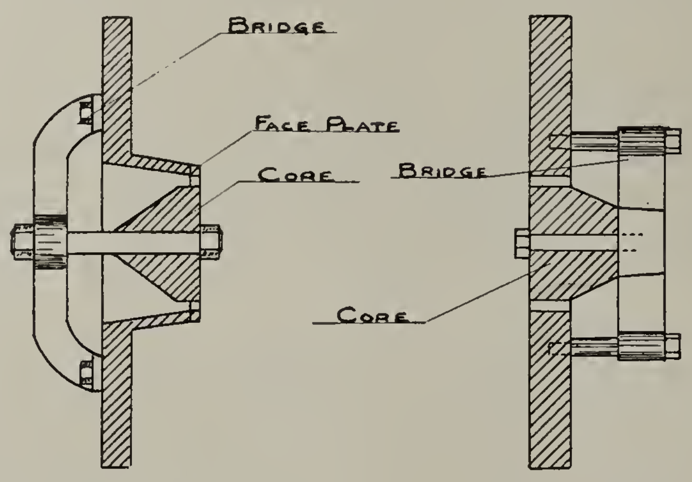
When a clayworker orders a hollow ware machine there is one item which should receive his most careful attention; that is, to see that the *auger or main shaft is abso-*

lutely central in the barrel. It will even pay to make the trip to the factory before the machine is shipped in order to satisfy himself.

No one can estimate the amount of die trouble that has been caused, and the money lost, thru time consumed in taking off and putting on dies, and thru cracked ware, simply because this shaft was not properly located.

It is naturally expected that machines come from the factory in perfect condition, but in the past this has not always been the case. *The experienced tile makers look for such defects,* but the man who is just getting into the game is not very likely to look for trouble in the machine as soon as it arrives.

Very often the auger shaft on a used machine will be slightly sprung, and this is even worse than having it out of center. It is practically impossible to successfully make ware on a machine in this condition, as the auger changes the lines of pressure on each revolution. In the case of the shaft which is not central, the pressure is always released at the point where the circumference of the auger is farthest from the sides of the barrel.



Tapered Die

Flat Die

Fig 1

SPEED OF MACHINE—EFFECT ON DIES

The speed of the machine is a very important factor. A die may be built which will run out ware at a slow speed—say ten feet per minute—which will pass thru the drier in perfect conditon. But if an attempt be made to speed up the machine so as to make fifteen feet per minute, the resulting ware is a dead loss.

Some clayworkers upon finding this to be the case, have provided for the machine a drive from a separate engine, or better still, from a variable speed motor. To resort to these methods in most cases, however, is foolish, to say the least. The clayworker who "goes after" such a die and so adjusts it that he gets from twenty to thirty feet per minute is more than repaid for the trouble taken.

When a machine is being driven too fast for a die, the latter invariably develops fast and slow areas. Sections of the die which give the least resistance to the clay flow, either thru wider webs or walls or the location of bridges, will be fast in proportion to other sections. In cases which are not bad, the ware may appear good enough to go into the drier, but will come out cracked. In extreme cases the column will tear up as it leaves the die. The remedy for this trouble will be taken up later in the article.

In determining the speed at which a machine should be driven, the raw material enters very little into the consideration. Of course, clays and shales vary enough to make some difference, but they are not the determining factor. When a machine is to be driven at constant speed, the most important point to be considered is the relation between the size of the largest die—or rather the largest tile—which will be made, and the capacity of the barrel of the machine.

When the auger is driven at too great a speed on a large tile, there is not sufficient compression in front of it to give equal pressure over the whole die. This is due to the large amount of openings in the die, the clay getting away comparatively too fast. There is practically nothing that can be done to a die to eliminate this trouble. With a lower speed, the clay gets a chance to gather between the auger and the die, the space forming a sort of reservoir, and it is then compressed and flows out evenly thru the die openings.

When a machine which can only be run at one speed is used to make a variety of sizes it is necessary to determine the speed acording to the size of the large tile. Many modern hollow ware plants have separate units for the large and small sizes, thus getting away from the difficulty. This, however, is not a general rule.

While it is obviously impossible to give the best auger speed on account of the great variety of raw materials, the speeds most widely used range from 20 to 25 R. P. M. In a few cases the auger is run up as high as 50 R. P. M. but such practice is condemned by hollow ware manufacturers generally. The machine or auger speed is another troublesome item in connection with the converted brick machine. Brick machines are always run at higher speeds than tile machines, or at least should be, and unless the machine speed is lowered for hollow ware, trouble is almost certain to ensue.

TYPES OF DIES.

For all practical purposes hollow ware dies may be considered as being of two types, viz.: flat and tapered (see Fig. 1). Flat dies are always dry, but the tapered type may be either dry or lubricated. There is practically no difference in the methods of adjusting the two types when run dry, but difficulty is often experienced with lubricated dies, due to their complicated construction. True, they are less likely to give trouble when first started, but like all tile dies their "middle name is 'Trouble'". It may be well to note in this connection that the large manufacturers use dry dies, and this fact should be enough to convince beginners *that this kind of die is the best,* not only to begin with, but to stick to.

In the flat type the openings are almost always straight, i. e., the sides of the die plate and the sides of the cores are parallel thru the entire thickness of the die. In the tapered type the die tapers on all sides down to the face plate, thru the thickness of which only are the sides of the die parallel with the sides of the cores.

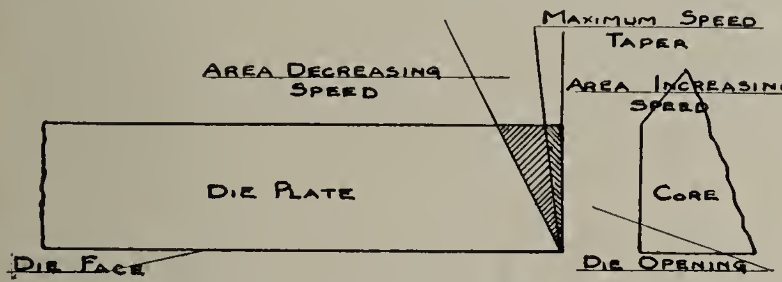
The taper or angle of the openings of a die present one of the most interesting problems in die construction and adjustment, in fact the *speed of the column issuing from any die is regulated by this taper or angle.*

When the tapered die was first introduced, the idea of the taper was to give a slight compression to the clay before it issued from the die plate. Each die manufacturer had his own ideas as to the amount of taper a die should have, depending somewhat upon the clay or shale that was to be worked.

A few of the more progressive hollow ware manufacturers have found that the amount of taper given a die is of the utmost importance. No rules or laws which might govern this can be laid down, *for each individual clay or shale requires a separate treatment;* that is—each clay or shale or mixture *will develop its greatest column speed when run thru a die at a certain temper.*

In some cases this taper is so slight as to be almost negligible, in others, it is considerable. In order to find the proper taper for any material, it is necessary to make a die of some soft material—preferably wood. It should be made with perfectly straight openings and the cores should be of the same material. When put on the machine the column speed should be noted constantly. As the clay wears away the material of which the die is made, the bar will speed up until a certain point is reached—*the peak*—after which the *speed will drop constantly.*

As soon as the column reaches the greatest speed, the angle of wear should be noted. Two or three trials may be necessary to determine this point, but when it is once obtained it may be worth thousands of dollars a year to a manufacturer. One of the important points to note is that as the taper is increased beyond a certain point the column gets constantly slower (see Fig. 2).



Showing Maximum Speed Taper For Theoretical Clay

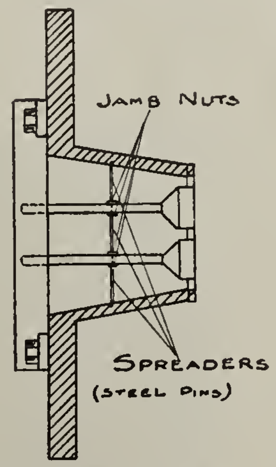
Fig 2

This is exceedingly important to the manufacturer who is buying "stock" or ready-made dies. How does he know but that the dies he is buying have a taper far greater than his raw material will stand? Maybe a die with more or less taper would increase his tonnage from twenty-five to a hundred per cent, especially on certain kinds of slow running tile. One thing should be borne in mind in this connection—no taper at all is far better than too much. The increase in column speed from the no taper point to the maximum speed taper is often little or nothing, *but beyond the maximum speed taper the column invariably slows down.*

In order to take care of the wear on the dies, some manufacturers build them with less taper than is required to produce the maximum speed, and allow the die to wear to the proper angle—passing which it is rebuilt or relined.

To make a die exactly right originally would mean that practically from the moment it was put on the machine it would get slower. The slowing down of the column is caused by the wedging effect which the clay gets in passing thru an opening which is wider at the point of entrance than at the point of exit. The mixture of clay grains and water can be compressed up to a certain point, but beyond that point no more compression is possible and the clay wedges as it attempts to pass thru.

A difficulty often experienced in the taper type die, and this is especially true of dies with considerable taper, is the springing of the cores out of positon. The great length of the cores and posts and the excessive compression within the die itself combine to make this a common trouble. Sometimes "spreaders"—small screws or pins (Fig. 3)—are used to overcome this difficulty, but care must be taken that these are not placed too close to the front of the die, as they will develop cracks in the ware. When cores are forced even a sixteenth of an inch out of place, the loss of ware in the drier is likely to be great.



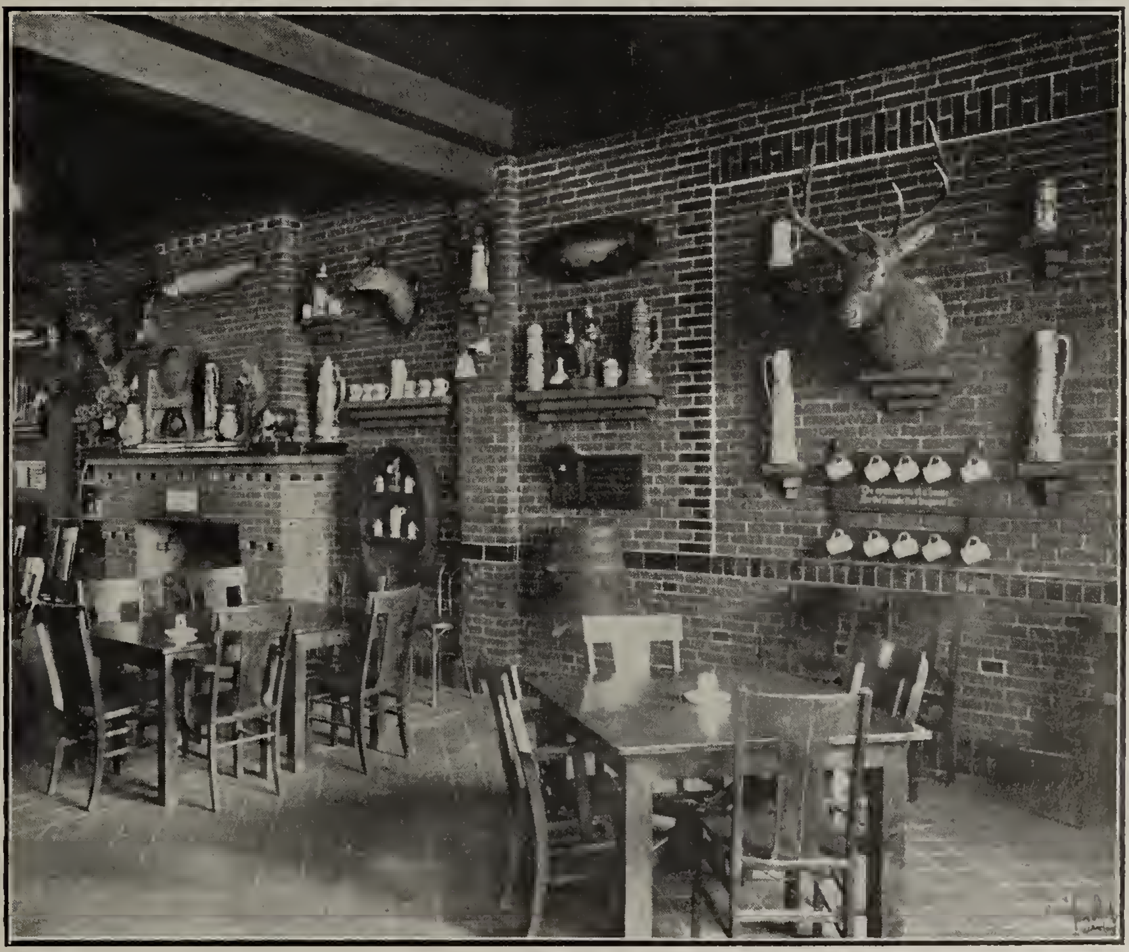
Showing "Spreaders" For Keeping Cores From Shifting

Fig 3

A long mouth die, or in other words, a long die, should be avoided whenever possible. A short die is much less likely to cause trouble, is lighter to handle, and consumes far less power. Clayworkers often contend that only one type of die will work on their particular material, when the fact is that they have never tried any other, nor tried to improve on the ones they use. It is simply a case of their having started with one type and continued to used it, altho it is quite possible that it may be the most troublesome type they could possibly use. Lack of initiative in this direction, as in many others in this industry, is responsible for much of the tile maker's trouble. *(To be continued)*

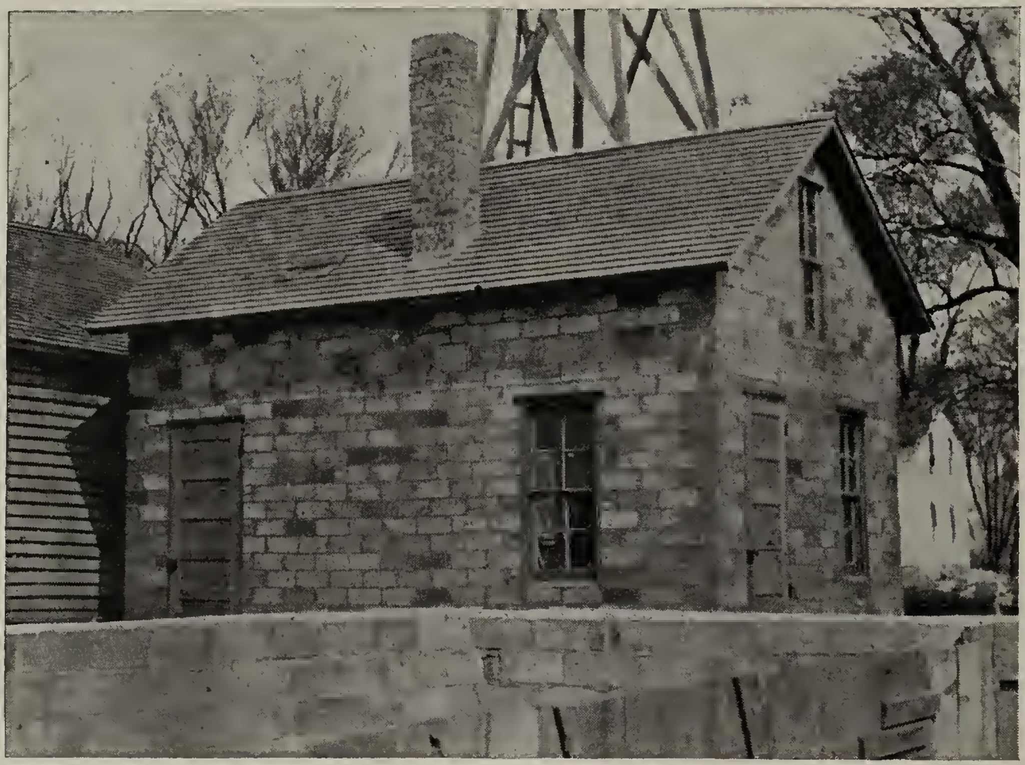
B. P. O. E. Enjoys Pattern Brick Interior

INTERIOR brickwork finds a place in many kinds of buildings, but is peculiarly adaptable to clubhouses and hotels. The accompanying illustration shows the grill of the Elk's Club in St. Louis, Mo., a description of which was given, some time since, in the "Hotel World." Three kinds of brick were used in this work, the body being a rough-faced brownish red, in five shades and beautifully blended. The trim is a mottled green enamel brick and the stein racks are made of a rose-colored, smooth brick. This combination of textured brick with enameled brick is said to be startlingly beautiful, the effect being heightened by the dark wood of the furniture and the dull red tile upon the floor. The brick used were all "Hy-tex."



OUTBIDDING *the* LUMBERMAN *on the* DAIRY FARM

THE HOLLOW TILE MILK HOUSES SHOWN IN ACCOMPANYING ILLUSTRATIONS HAVE BEEN BUILT ON FARMS IN IOWA AND AT COSTS THAT PROVE IDLE THE CLAIM THAT FRAME FARM BUILDINGS OF THIS TYPE ARE LOWER IN FIRST COST THAN BUILDINGS OF BURNED CLAY



WHERE can a substantial milk house, measuring nine by fourteen feet and eight feet high, be built in wood for less than a one hundred dollar bill? And a much larger house, with an attic, for fifty dollars additional?

Yet these figures have been duplicated by masons who have built hollow-tile milk houses on at least two Iowa farms that were slightly less in cost than a good frame building. The house shown in the above illustration is on the Futrup farm, in Cerro Gordo county, Iowa.

DAIRYING is rapidly becoming a large and specialized branch of agriculture—one that is characterized by an individual buying power greater than that of the ordinary farmer. The dairyman's methods of producing and marketing his product are head and shoulders above those followed in general farming. And it is a fact that the dairyman has, as a rule, much better and cleaner buildings than his farmer neighbors and he is far more willing to spend money on these buildings when stability, long-life and a sanitary interior are to be obtained by so doing. It follows, therefore, that these farmers are highly desirable customers for the clay products manufacturer.

An important building on the dairy farm is the milk house. While the amount of material required for this building is not large, the installation of a burned clay milk house might readily lead to an order for barn material, especially if its record for satisfaction is as good as the showing made by the houses here illustrated.

The first requisite of the milk house is that it be sanitary in every respect, says "Hoard's Dairyman." Then it should be dry and cool, especially in summer. There should be no doubt in the mind of the farmer or dairyman as to the desirability of a substantial construction for the milk house—not necessarily a costly or expensive construction, but one designed to resist, as much as possible, the decaying influence of the moisture that is always present in this building, due to the handling of water.

A milk house that meets these requirements, and at a lower cost than other types of masonry construction, is shown in the accompanying illustrations. With the help of a country mason, who has laid the walls in one or more buildings where hollow-tile was used, milk houses such as those shown can be built for a price that compares very favorably with the cost of a good frame building.

The house shown on the following page is on the Wybourne farm, in Cerro Gordo Co., Ia. This building is nine feet wide, fourteen feet long and measures seven feet, four inches to the eaves. The walls are constructed of hollow clay building tile, making an eight-inch wall. The roof is built in the usual way, with 2x6 rafters and then shingled.

The interior of the house is as simple as its exterior. A water trough is located in the rear of the room in which the cans of milk are placed to cool. This tank or trough is constructed of the same material as the walls of the building, but is covered with a coat of cement to enable it to hold water without leaking. On the south side of the building may be seen a pipe leading to the inside. The water from the well, which adjoins the house, is pumped up by a gasoline engine into this pipe, from which it flows into the trough on the inside. Near the top of the tank is an overflow outlet which carries away the surplus water as the fresh, cool water is pumped in. This overflow is piped to the barnyard, where it is used for watering purposes. This arrangement keeps a constant supply of cold water in the tank, since the pump on the well is working continuously, and does away with the necessity of ice in warm weather.

A very interesting feature of this building is the floor, which is a combination of hollow-tile and concrete. A half-inch sand cushion was first laid, and then tamped. On this cushion were placed 4 x 12 x 12 inch tile, and on the tile a two-inch topping of cement was spread. When well drained, this construction makes a floor that is dry. This is due to the hollow-tile in which the intervening air spaces, acting as an insulator, prevent the floor from becoming cold from the earth beneath and condensing the moisture in the outside air, especially during the winter months. The itemized cost of this building is as follows:

Foundation (Labor and Material)	$ 4.00
Walls (Labor and Material)	55.25
Floor (Labor and Material)	9.70
110 lin. ft. 2x6 in. lumber for rafters	3.94
6 Bundles of Shingles	9.63
175 ft. of Sheathing	5.25
Millwork (one door and one window)	5.25
Nails and other miscellaneous hardware	5.00
Carpenter labor	7.20
Total	$105.22

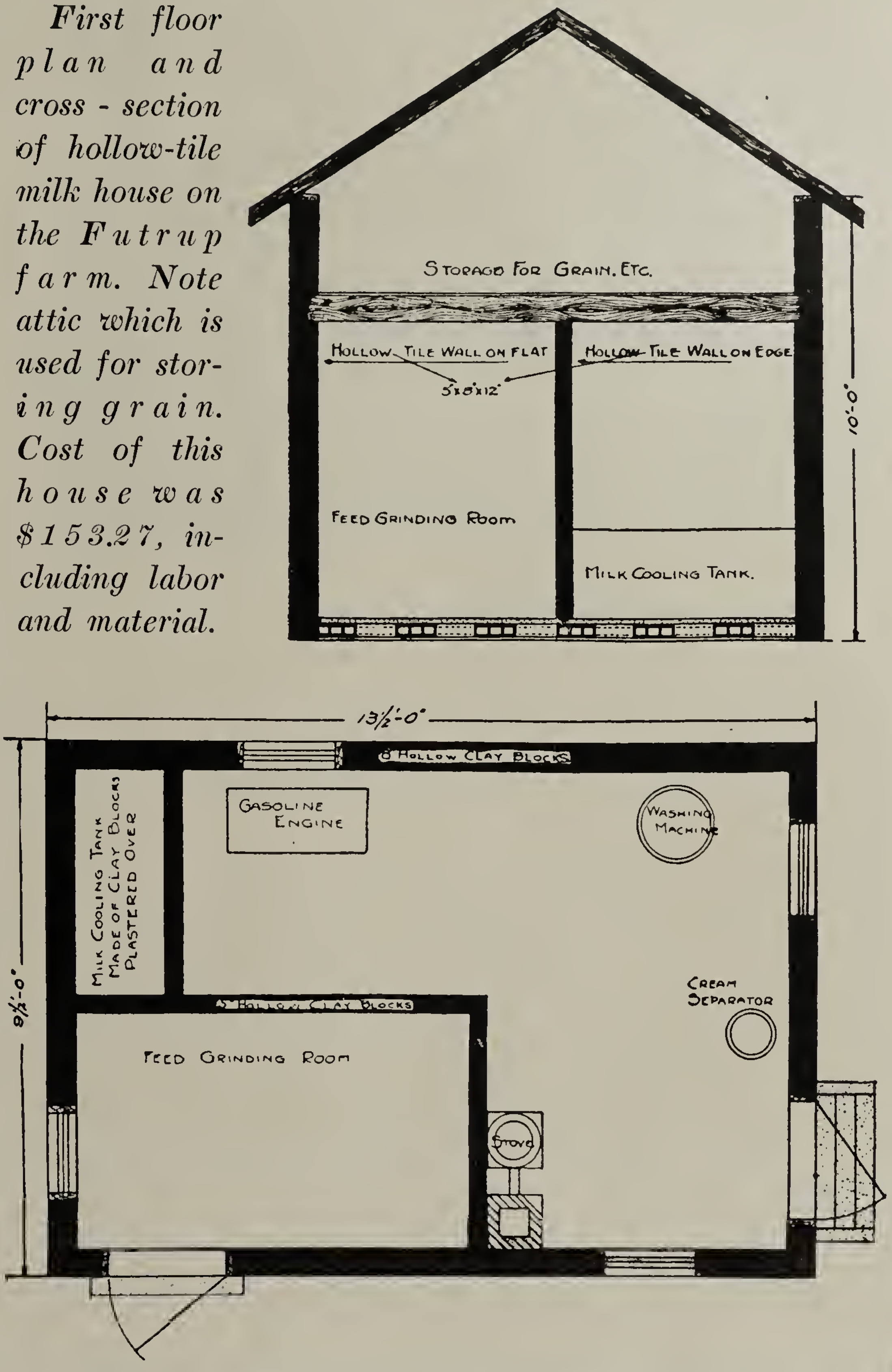
The other illustration is that of the milk house on the Futrup farm in the same county. This house is also built of hollow clay building-tile. It is nine and one-half feet wide and thirteen and one-half feet long, being ten feet high to the eaves.

In addition to being a receiving room for the milk, this house offers a place to store feed. The building, as can readily be seen by the window in the gable, is a story and a half in height, the upper floor being used for feed storage.

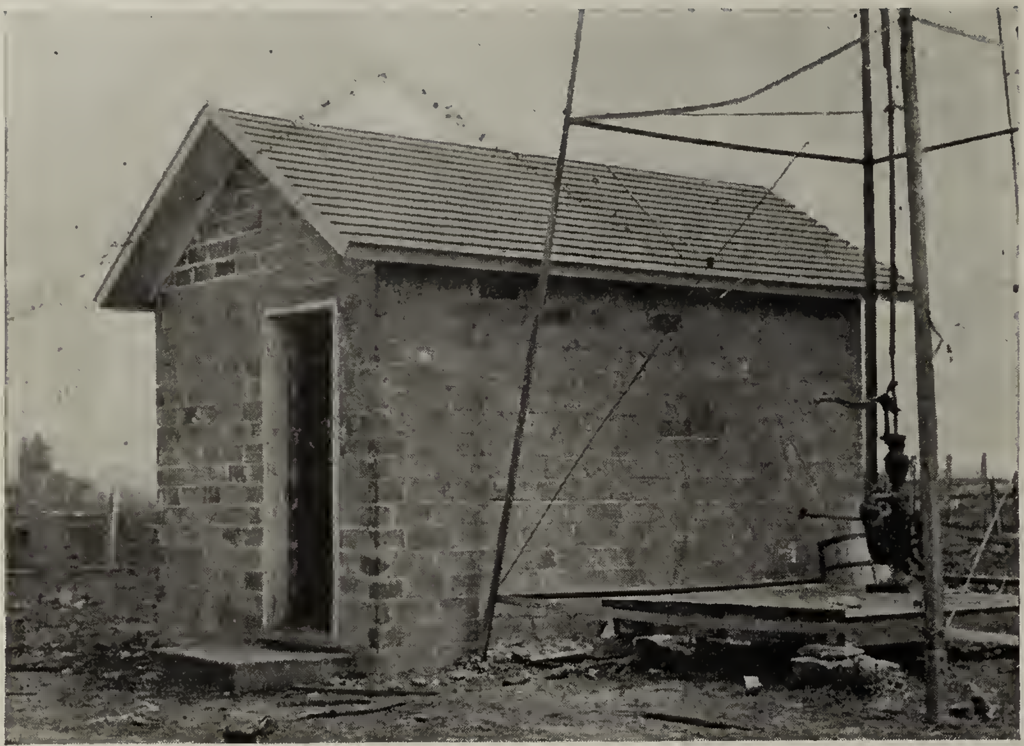
A stairway leads up to it thru the door at the rear of the house; this stairway, however, is entirely shut off from the first floor by a hollow-tile partition, so that the traffic up and down these stairs does not bring dust or dirt into the room where the milk is handled.

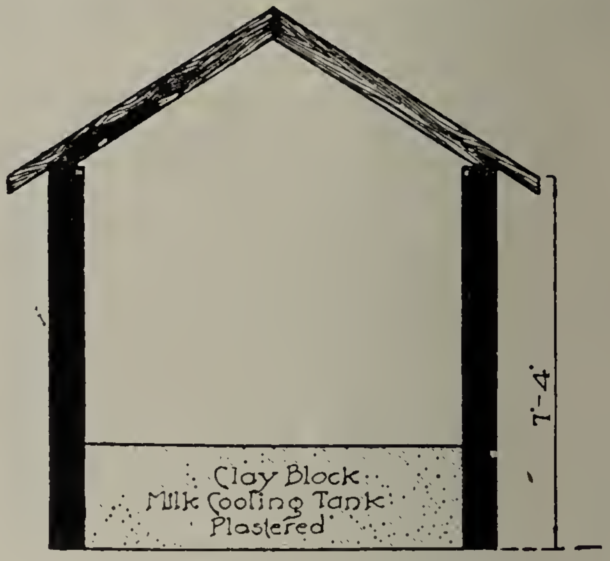
A water trough or tank in the rear of the house, similar in construction to that on the Wybourne farm, keeps the milk cool, being supplied with a constant flow of water from the well at the north of the house. A small laundry stove for heating water is placed in one corner of the milk room. The following is the estimated cost of this building, using the prices for labor and material prevailing in the county in which it was built:

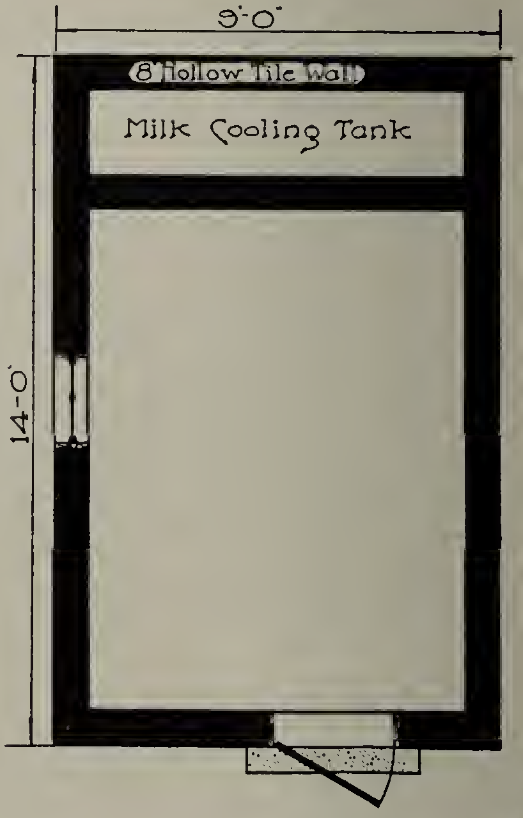
1,475 pieces of hollow building tile	$ 51.60
22 pieces of 2x6 in. 10 ft. long lumber for rafters	
420 sq. ft. roof sheathing	
420 sq. ft. shingles	



First floor plan and cross-section of hollow-tile milk house on the Futrup farm. Note attic which is used for storing grain. Cost of this house was $153.27, including labor and material.







Hollow-tile Milk House on Wybourne farm. First floor plan and cross-section showing construction. Cost of this house was $105.22, including both labor and material.

16 pieces of 2x8 in. 14 ft. long lumber for floor joists	
294 ft. of flooring for same	
4 windows with openings 3 ft. 6 in. x 6 ft. 6 in.	
2 doors with openings 3 ft. 6 in. x 6 ft. 6 in.	
Total cost of lumber	61.68
Labor	40.00
Total cost	$153.27

In figuring the cost of both of these houses, the quantity of different materials used has been given, as far as possible, in detail. With the assistance of the local building material supply man, together with pencil and paper, it should not be difficult to determine just what either one of these buildings would cost on any farm, taking the labor cost to be very nearly the same in most sections of the country.

It is needless to say that a milk house of this type is sanitary in every respect. The walls, built of hard burned clay tile, offer no breeding places for germs. There is no material about these houses to absorb water and decay. With a well-drained cement floor, these structures are very easily cleaned and kept clean.

Dryness has been mentioned as one of the chief requirements of a milk house. With the surplus water well taken care of on the inside, the only other sources of moisture are from rain coming through the walls, or the condensation of moisture on these walls from the inside air. With the doors and window frames well fitted into the wall, it would take a lot of talking to convince the average man how any water could get into these houses, except thru a leak in the roof, which with a little attention would hardly ever occur. Then we have only one source left from which moisture would ordinarily come, and that is by far the most common cause of dampness in milk houses.

Nearly everyone has seen the great drops of moisture that collect and trickle down the sides of a pitcher of ice water on a warm day. The cold surface of the pitcher, coming in contact with the warm moisture-laden air, condenses that moisture in the form of dew. The same thing happens when the surface of a cold wall comes in contact with warmer air containing a large amount of moisture. Small drops of water collect on the wall and soon multiply, until a damp condition is produced. This is more often the case in cold than in warm weather. During the winter the cold outside air soon chills the wall of solid masonry, upon which the moisture in the warmer inside air condenses.

It has long been recognized that air is a better insulator against changes in temperature than a solid material. For this reason, the hollow building tile used in the construction of these milk houses makes a thoroly dry wall. The intervening air spaces in the tile prevent the transmission of heat or cold thru the wall, the outer wall of the tile assuming the same temperature as the outside air, and remaining so, while the inside wall of the tile assumes the temperature of the inside air. Thus when it is cold out-of-doors, the air spaces in the tile wall prevent the inside wall from becoming cold and condensing the moisture in the room.

This same feature of the hollow-tile wall is responsible for the fact that a building constructed of this material is cool in summer and warm in winter. The dairyman can readily see what this fact means in the construction of a milk house. The house that is cool inside while the mercury is trying to force the top off the thermometer, will mean a big saving in ice and cut down the loss thru spoiled milk. On the other hand, a house that is warm in winter will allow the milk to be cooled without permitting it to freeze.

When, in addition to these advantages, is considered the fact that this type of building is very nearly fireproof and will stand for a good many years with little or no repairs, and without paint, it would seem that such a building would be a good investment for any farmer to make, for not only would it be without expense of upkeep, but would pay a dividend thru its greater efficiency and safety.

WHO *is* RESPONSIBLE *for* REJECTIONS?

BY H. R. BEEGLE, Secretary and Treasurer
Beaver Clay Mfg. Co., New Galilee, Pa.

This paper, which was read before the American Face Brick Association, at its recent convention at Old Point Comfort, Va., is another important addition to brick literature. It uses a surgeon's scalpel on a phase of the brick manufacturing and selling business, which has long needed some such heroic treatment. Every manufacturer knows what it is to be "stung" with an allowance—every dealer knows what it is to meet competition that cuts the price and then looks around the corner to secure a profit thru allowances.

I SUPPOSE the reason I was asked to write a paper on the subject of the manufacturer's responsibility as regards the rejection of his material by the dealers to whom it is shipped—or by the men to whom the dealers have sold it—was because the secretary thought the company I represent is the only one that suffers from the wrongful rejection of its product, or that our sufferings in this way were very much greater than those of other plants making similar material.

I suppose that, this being his idea, he thought that other members of the association, not having had any experience of this kind, would theorize—and theory is not what the case requires. However, the subject is a very serious one to every manufacturer of face-brick, because all have rejections, some of which are justifiable, and some not. Taken together, they represent a loss that has its effect upon the cost of production and upon the profitable selling price.

I believe that some action should be taken by the association, leading to a more clear and definite understanding between its membership of manufacturers and the dealers who handle the material that is produced by them.

I believe that all rejections can be traced to, and be classed under the following general headings:

1. Where the manufacturer intentionally ships brick that are not right—and takes a chance.
2. Where bad brick are shipped thru ignorance or error on the part of the manufacturer's employees—but not intentionally.
3. Where the dealer has sold one grade of brick and intentionally orders the shipment of a cheaper grade.
4. Where the dealer is ignorant of what he is selling—or has sold.
5. Where the customer is ignorant of what he is buying—or has bought.
6. Where the customer is a rascal.

THE FAULT OF THE MANUFACTURER

The first proposition would apply to either grade or shade. Sometimes a dealer has badgered and worried a manufacturer for a very low price, and intimated that something not quite so good as "firsts" would go; and the manufacturer feels justified in sending along something that he would not have shipped, had the order come in for "firsts" at the regular price. If this material is rejected, the manufacturer should not make a fuss. He "took a chance" and knew that he was taking it.

The second proposition is caused by the problem of ever-changing labor, by "booze" and by carelessness. I am afraid that we will never wholly change these conditions—at least not so long as the price of brick precludes the possibility of paying high enough wages to invite intelligent labor.

A man may work on one yard until he is really valuable as a brick wheeler and sorter of the shades peculiar to that yard and—presto!—some fine morning we find him on another yard, pushing a barrow there, and trying to scrape an acquaintance with an entirely different kind of brick, of an entirely different color range, and under a system of shading and sorting that is as different from that employed on the first yard, as is the product.

The day after a night of carouse has brought grief to many a plant where close shading is required, while carelessness has caused a lot more. This last is something that is difficult to guard against. You can tell when a man has been drinking, but you cannot tell, until the harm is done, that a man is gradually growing careless.

So here is another proposition where the manufacturer will have to submit to allowances due to rejections of material that are not equal in quality, or of the proper shade—that is, not the shade that the dealer sold. And he might as well do it gracefully and cheerfully, for the fault, while not altogether his, is in his plant—and he is responsible.

THE FAULT OF THE DEALER

The third proposition requires little discussion. The manufacturer should absolutely decline to make any allowance, but should insist upon full payment for the brick shipped in accordance with the dealer's order. The trouble is, however, that the manufacturer does not always know what the dealer has done, and investigation frequently costs more, in actual railroad fare (to say nothing of time) than the "allowance" that the dealer wants to make, or has made, to secure the acceptance of the material. There is another point, right here, that requires some thought. Few manufacturers understand that it is "good business" to investigate every rejection, no matter what dealer's office reports them. Someone is at fault—some one of three people, the manufacturer, the dealer or the customer. *If the manufacturer does not know that it is his fault then it is his duty to refuse to make the allowance until he has investigated the circumstances of the rejection.* If this investigation shows him that the brick were not right, he may find a means to prevent a recurrence of the same condition. It may show him just where carelessness is growing on his yard—a place he thought entirely free from it.

It must be remembered, however, that there are three people concerned—the manufacturer, the dealer and the customer. The chances are, therefore, two to one against its being the manufacturer's fault. *For that reason, even tho his regular "investigations" may not be welcomed by dealers who are very proud of their reputations for "never asking an allowance where one is not justly due"* it is well to continue to make them, for despite their claims to the contrary, there are dealers who are very ready to make an allowance that they know someone else will pay—who are built with a weak back-bone, and who let their customers walk all over them.

Of course, if it develop that the dealer sold "firsts" and then tried to palm off "seconds"—the course is clear. Get another dealer. The man who will "trim" his customer will "trim" you. He may not have done so yet, but he will try to, sooner or later. And it will cost you more to watch him than it will to change over to some man whose business ethics are more in accord with modern practice.

THE IGNORANCE OF THE DEALER

Under the fourth proposition, which is the dealer's ignorance of what he is selling, may be classed, I believe, nine-tenths of the rejections that are made and the allowances which follow them.

Some dealers betray a most lamentable ignorance of what they sell. Let me cite one of our own experiences to illustrate. We had shipped a certain dealer, on one or two occasions, some smooth "seconds" that were extraordinarily well graded. Later, upon a subsequent order for second quality brick of the same general shade, we shipped a regular second quality run—no better and no worse. Soon we received word that the car had been rejected, and I made it a point to look the shipment over, after it had been hauled to the dealer's yard.

There was absolutely no reason for rejection save that the dealer had promised something altogether better than a second quality brick. The shipment was a good car of "seconds," well shaded and graded, but the dealer's argument was that it was not equal in quality to previous shipments—the ones that were extra good.

Now this dealer had visited our factory—just once in five or six years. There was one of the troubles—he doesn't take time to visit any factories. He is not familiar with plant conditions, grading, shading, or anything else. And he takes no pains to become so. This man accepted the exceptionally good service that we had given him on one order—an order placed at a price that was "off" from first quality price; he had received brick that struck him as being almost, if not quite, as good as "firsts" and, without inquiring into the matter, *he let that shipment establish a standard of quality for "seconds"*—or for brick he could buy at a low price—and made sales accordingly. When his customer did not get the "bargain" he was led to believe he would get, the dealer "passed the buck" to the manufacturer, expecting him to make an allowance which, in this case, would have included teaming charges and double handling.

The dealer did not know what he was selling. The customer did not know what he was buying—the manufacturer was supposed to step into the breach, and with the magic wand of "allowance" heal all of the wounds of ignorance.

The customer cannot know what he is buying unless the dealer knows what he is selling him. The dealer cannot know what he is selling unless he makes a practice of going to the plants that he represents, at regular intervals, and surely not less than two or three times a year.

I believe that dealers are beginning to recognize the advantages of these visits, and I want to urge upon the members of this association that they keep pounding away at their representatives, month in and month out, until they establish the habit of plant and stock inspection by the man who is selling the product—anywhere, no matter how distant. And I want to urge that a record of these visits be kept, so that the manufacturer can say: "It is now nearly two years since you were at our plant. Many of our dealers come twice—some three times a year. They and we see the value of these frequent visits—why don't you?"

THE CUSTOMER'S FAULT

The fifth proposition—that of the customer's knowledge of what he is buying, is so tied up with the dealer's knowing what he is selling that it is hard to keep them apart. Perhaps it is well, for the moment, to go beyond the dealer, and look at his salesmen—if he has more than one, and at the way they handle sales of face-brick.

Do they try to honestly impress the buyer with the *facts* of grade and shade? If they are in doubt, do they come back to the office, or 'phone the dealer, asking whether or not they can safely promise certain things? Do they, when called upon to meet a low price, *offer a second quality of the brick that they have been showing at a first quality price, saying that the factory "grades their 'seconds' so well that they are practically as good as 'firsts'"?*

Do they believe that the manufacturer is so in love with doing business at a loss that he will grade out brick that are "practically as good as 'firsts'" and sell them for a second quality price? If they don't, then they wilfully deceive their customer—and the customer cannot be blamed if he buys what he believes to be a bargain, and "kicks" when the delivery proves that he only bought value for value.

Too often—much too often—the salesman is caught between his desire to "beat the other fellow" out of the business, and his own proper caution—caution that will keep him out of trouble when the brick is delivered, and help him to keep the confidence of his customer.

The salesman who turns in a lot of orders, but whose trail is one of dissatisfaction, rejections and allowances, will bear watching. He may be bringing in the business, but he is hurting the standing of the dealer, the manufacturer and—almost everyone but himself. He gets the credit for being "slick." The fact is, he is a better liar than the competing salesmen, and a better confidence man, when it comes to making the shipment "stick." But his customers do not follow him—the concern that employs him loses in the long run.

The customer ought to know what he is buying, and for this reason, it would be well for every dealer to make a practice of mailing a letter of acceptance to every customer, for orders that are brought in—particularly orders for "off shade" or "off quality" brick. In that letter, tell the customer just what he is to expect, and ask the salesman if that is the way the order was taken. A few little episodes of this kind and the salesman will be made to understand that the reputation of the house is in his keeping.

So proposition five comes back to the dealer's knowing what he is selling, and being sure that the buyer understands what he is buying. If the dealer does not make this plain to the buyer, then the fault is the dealer's, and the manufacturer should not accept any responsibility for any fault that is not clearly his own.

WHERE THE CUSTOMER IS CROOKED

More rejections occur because the customer is crooked than any of us, who had not made a study of the situation, would believe. Having learned of the ease with which a reduction is "earned" by a rejection, these customers can always find some flaw in the shipment that will give ground-work for a claim. I believe that the entire brick industry has been too lenient with this type of customer—manufacturer and dealer alike.

The dealer stands between this man and the manufacturer, and should not call the manufacturer in to act as arbitrator, or otherwise. Certainly no city is so large, and no competition so bitter, that men of this type cannot be listed, so that the entire trade could be warned that it was a part of wisdom to at least draw up a contract that will compel the acceptance of material that comes up to the quality purchased.

This association could well keep a similar list, so that, when called upon to sell any of these crooked individuals in places where there are no sales representatives, we too would be fore-warned.

THE SHIPMENT THAT IS DELAYED

There is another type of rejection, and a very serious one. Some times, after a manufacturer has promised, in good faith, to make a shipment by a certain date, he finds himself unable to live up to that promise. It may be that, a few days later—maybe a week later—he can make the shipment. He has no orders to cancel—no word to withhold shipment. He loads and ships.

In the meantime, the customer, impatient at the delay, decides to use some other brick. He does not notify the dealer until the car is in transit, or perhaps at its destination and refused.

All three—manufacturer, dealer and customer—are equally at fault. Since the customer is already disgruntled, the chance of getting him to stand his share of the loss is very slight. *But the dealer and the manufacturer should share the loss.*

You want to know why? Simply this—the manufacturer's promise of shipment at a certain definite date was the basis upon which the order was secured. Had the manufacturer refused to make any promise, the dealer would not have received the business. *That is proved by the impatience of the customer at the promised time of delivery.* If the manufacturer is careful to notify the dealer of failure to ship on the promised day, it is up to the dealer to hold the customer in line until the shipment is made, and to prevent the use of another brick after the shipment of the one first bought. Instances of this kind are largely chargeable to the dealer's not being "on the job"—but the manufacturer, too, is responsible, and for this reason, I believe the manufacturer and dealer should split the expense of rejections of this kind.

A WAY TO AVOID SOME OF THE TROUBLE

I would like, therefore, to make the following resolutions:

That the American Face Brick Association go on record that its members believe:

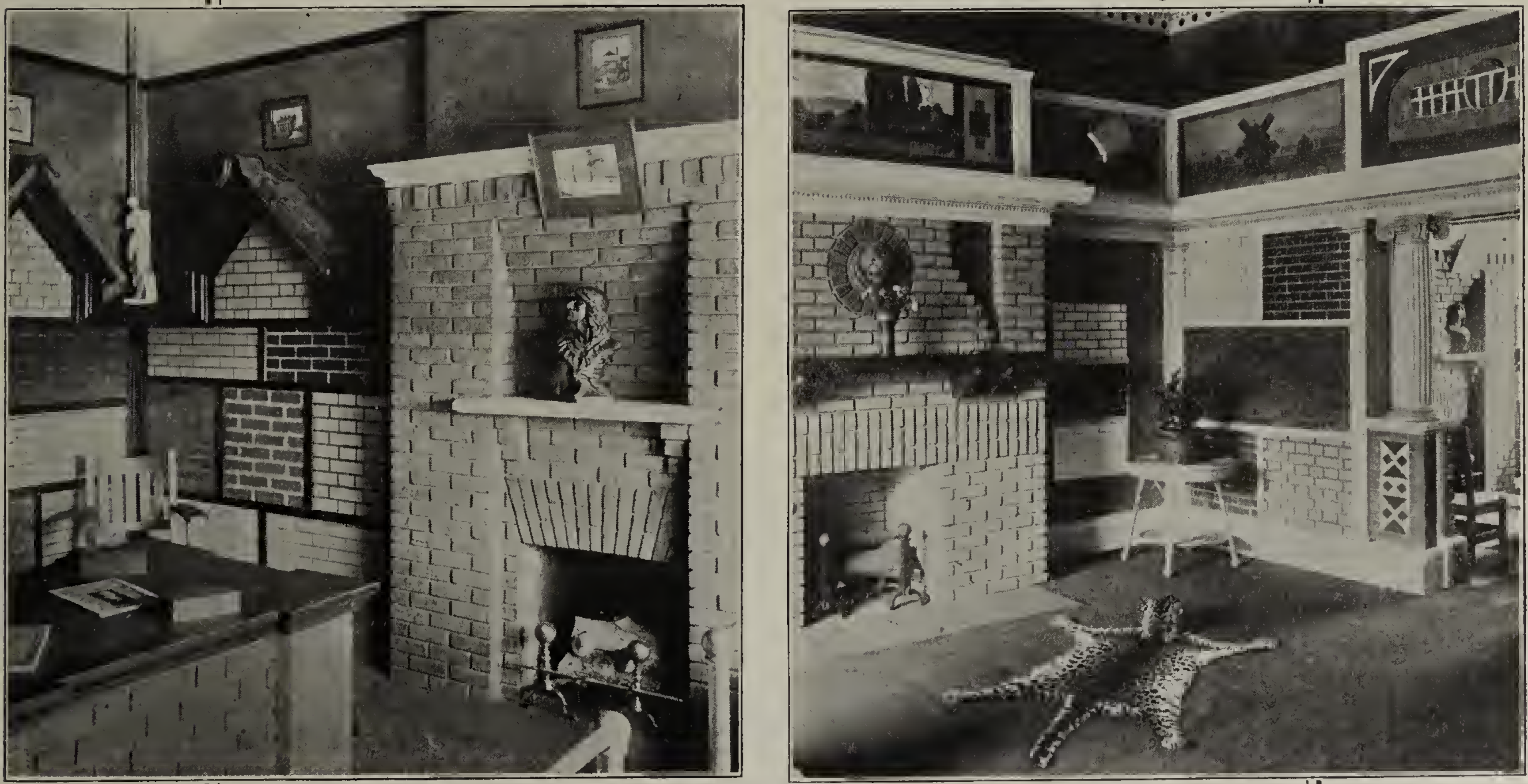
1st. That where rejection can be proved to be wholly the fault of the manufacturer or of his employes, said manufacturer should cheerfully consent to stand the loss incurred.

2nd. Where both the manufacturer and dealer are to blame, the loss should be equally divided.

3rd. Where the rejection is due to any other cause, the dealer must stand the loss, his refusal to do so being sufficient ground to make him an undesirable agent for any member of this association.

4th. That the members of this association believe it desirable that their dealers, sales-agents and representatives visit the factories the products of which they are selling, at least once—and if possible, two or three times each year.

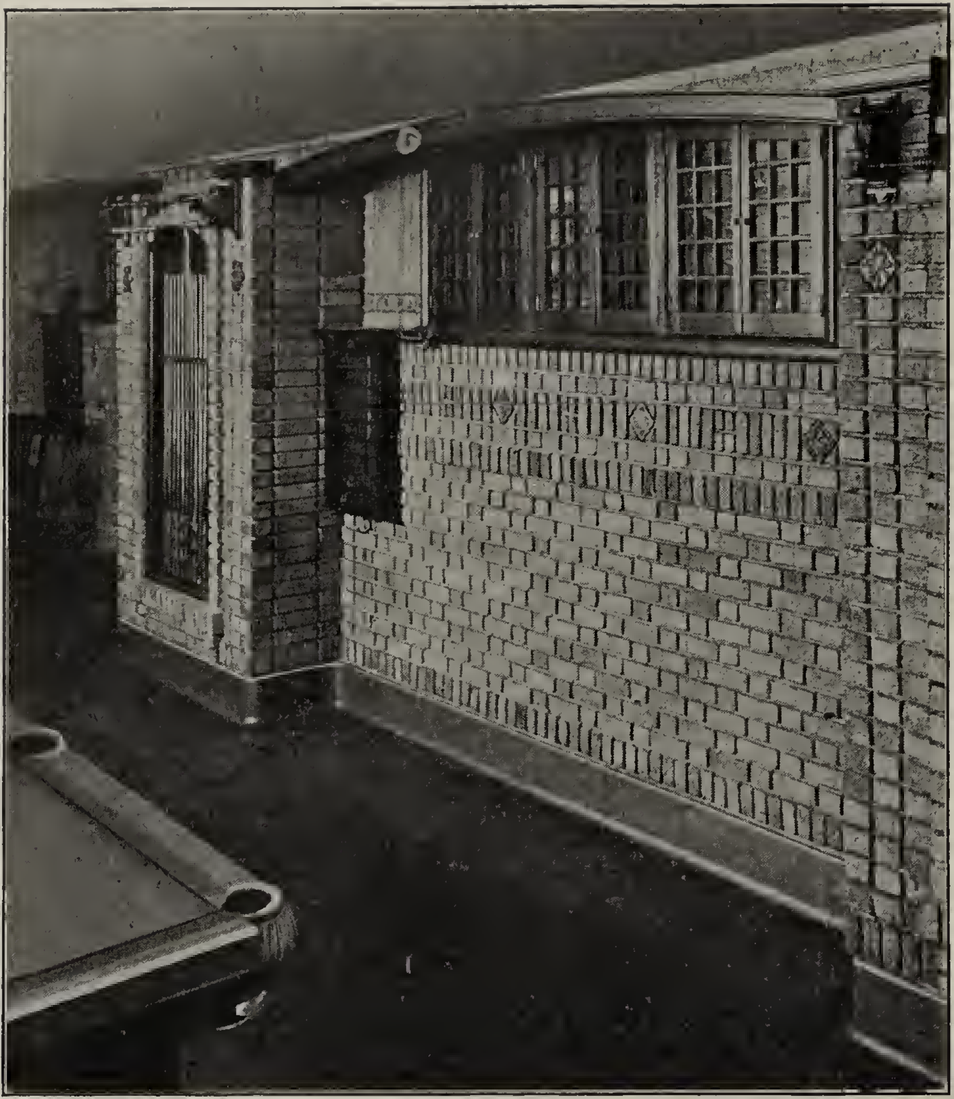
The Show Room De Luxe



The Pearson Brick Company, of Beaver Falls, Pa., Believes in Giving an Air of Luxuriousness to its Brick Display. To Some Excellent Architectural Details are Added the Charm of a Well Planned Color Scheme.

MINGLING BRICK *and* CAROMS

JUST as the white, vitreous tile has invaded and pervaded the shops where food is sold, so has the warmer colored brick, with its various textures, come to a greater popularity among designers of interiors, the purpose of which is to cater to the human masculine.



The Brick Wainscot in the Billiard Hall in the Bowles Building, in Toronto, Canada. A Full Range "Golden Tapestry" Is Laid with a Wide, Neutral Gray Joint

INTERIOR brickwork has found its way into the realm of balk-line billiards and Kelly pool. In perfect harmony with the green cloth of the table tops, the soft-toned colors of a full range "Golden Tapestry" brick, laid in neutral gray mortar, form a perfect combination. The pattern-work that is a part of this brick wall adds the decorative note that would otherwise be lacking.

Architects and interior decorators who have seen the brickwork illustrated on this page have declared this billiard-room (which, by the way, is in Toronto, Canada) to be one of the best examples of a sensible adaptation of construction materials to a decorative purpose, that they have every seen. The wear to which the walls of a billiard-room are generally subjected, thru the tilting back of the high chairs that the players occupy between shots, is here met by a material that will neither mar nor soil. When dust settles upon it, a whisk-broom brings back its pristine brightness.

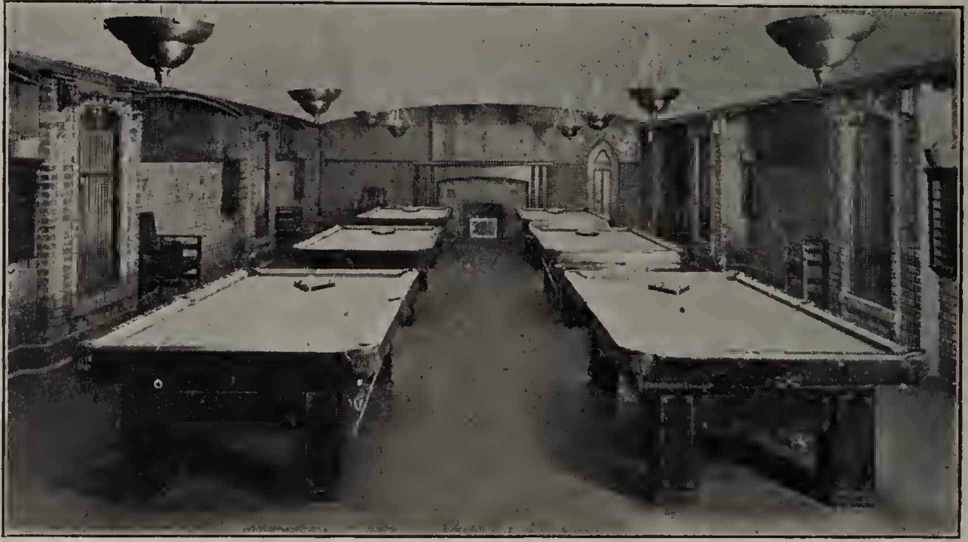
The play of color that comes from the variation in the brick is in keeping with the newer ideas of interior decoration—being very like the well known "Tiffany" frescoing. This many toned tinting is particularly pleasing in a case of this kind, since there is little in the furnishing of the room, other than the expanse of green cloth, to relieve a color monotony in the wall.

Nor is there any temptation, in a case of this kind, to drive nails into the wall, nor to "decorate" it with calendars, theatrical celebrities or champion billiard players, past or present. Any vandal who attempted it would have a bent nail or a broken hammer for his pains.

The man who scratches matches on fine woodwork and smooth plaster may succeed in getting a light from these walls, if he holds his match securely, and does not put too much mule-power into his stroke. If he is of the strenuous kind, he will lose his match-head—and maybe his temper.

Those who are in a position to know, say that this brickwork did not cost appreciably more than would have an equally effective scheme of stained hardwood and plaster. It has the advantage of these, in utility—it will "stay new" for many years to come.

And, in the meantime, everyone knows that, next to having good tables and good service, the great custom-bringing attribute of a billiard-room is its cheerfulness. In this, the billiard-room in the Bowles Building, in Toronto, scores a bull's-eye. So well is brick serving its purpose in this instance, that the owners of the building which contains this excellent example of interior brickwork later decided to use pattern brickwork in the restaurant building they were putting up in Toronto.



"The Pattern Work That Is a Part of the Brick Wall Adds the Decorative Note"

IMPROVING
on the
"DREAM PLANT"

"There are more things in heaven and earth, Horatio,
Than are dreamt of in your philosophy."—Shakespeare

IN the October 18 issue of this magazine, there appeared an article entitled "The Ideal Brick Plant—Electrically Driven." It was based on a letter written by the superintendent of a face-brick plant—one of the largest in the country. In it, he gave his idea of what would constitute an ideal equipment for the economical manufacture of high-grade face-brick.

From the many letters we have received, commenting upon that article, we have taken four. We earnestly commend them to you.

The authors of the letters that are published in this symposium are: John A. Randolph, of New York; H. P. Robbins, of Chicago; F. N. Carter, of New York, and George A. Balz, of Metuchen, N. J.

DREAMS based upon optimism, hope, confidence and practical conditions—circumstances that are not impossible and that sometime may come to pass—are pleasant, comforting, inspiring. The man with ambition and accurate foresight is likely to have dreams of this nature. Furthermore there have been countless instances when such dreams have been the germs of great achievements.

The account in the October 19 issue of "Brick and Clay Record" of the dream which the superintendent of a well-known brick plant recently had about an "Ideal Brick Plant—Electrically Driven" is a conception worthy of serious consideration.

The caption states that such a plant was never built, but is not impossible. Perhaps such a plant, in its entirety, never has been built, but in confirmation of the practicability of the facts set forth in the dream, there are plants in existence which incorporate many of the details pictured, especially the electric drive.

Only a few days ago, it was my pleasure to visit a large plant which, as I recall, embodied a large number of the features of mechanical equipment described in the dream story. Every wheel in the place was turned by induction motors, as in the "ideal plant." Even the electric power was alternating and carried at a voltage of 440 as in the story.

There was also plentiful evidence of careful attention to the "Safety First" idea mentioned in the dream article. There were incandescent lamps with tungsten filaments everywhere, furnishing an abundance of light to every part of the plant. There is no necessity for incurring danger thru groping in the dark at that plant. All the department heads and foremen are always within easy reach thru the intercommunicating telephone.

HAD VISITED THE "IDEAL" PLANT

The fact that I had visited this actual plant before reading the dream story, made the article doubly interesting.

The gravity method (mentioned in the story) of transferring the clay from the screen plates connected with the dry-pans to the elevator, seems commendable on account of its economy thru obviating the necessity for scrapers.

The use of the separate foundations, together with direct connection by flexible couplings for the motors which operate the crushers, dry-pans and disc-feeders shows good judgment. The life of the motor will be considerably prolonged by thus protecting it against the vibrations of the machines. The flexible coupling is an excellent precaution against sudden shocks.

The mention of the electrically driven scoop for handling raw material in the storage shed is highly interesting. It shows a practical application of the present tendency in all lines of industry to do away with the antiquated pick and shovel. The wide range of portability of the scoop also highly impressed me. Flexibility and general adaptability of this character conduces to efficiency.

Many electrically driven plants in actual operation in all parts of the country attest the story to be entirely within the range of present day practice. It was apparently written by a well informed brick man. If the methods described are adopted as far as possible in any brick plant, they cannot fail to greatly increase the efficiency of production and to increase the margin on the profit side of the ledger.

I HAVE READ with great interest your "dream" of an ideal brick plant. Are you not a little belated in calling it a dream? I see a plant that is so close to being reality than I would call it a "fact" rather than a child of fancy.

Here is what I see: Shale, in great quantities, adjoining the Metropolitan district with its 7,000,000 population. Beside it a trunk line railroad with a freight rate in the minimum zone of the Metropolitan district—a side track at the lowest point of elevation on the property—the shale raising back of the plant to a height of thirty to forty feet, with no stripping. Buildings of brick and steel with clay tile roof, electric power, AC motors of one of three standard makes, current furnished by the public service corporation, or possible of production right in the plant, the gas-engine run by producer-gas, shale close to plant and gathered by shale planer and shovel, both electrically driven, carried to shale bins by conveyor belt and from bins to pulverizer and dry-pans by conveyor belt with automatic feed.

From the dry-pans by wide belt and bucket conveyor to piano-wire screens, thence to pug-mill and brick machine, to automatic cutter and thence, by off-bearing belt, to a large, fireproof car that will take 2,500 brick.

BRICK SET ON A FIREPROOF CAR

On this car, the brick are set for burning, and the car is taken by an electrically driven transfer car to the drier, which is heated by producer gas. From the drier, the brick are taken—without being handled—to a tunnel kiln provided with a water-smoking chamber, a burning chamber and a cooling chamber, each chamber under separate control—using heat from the cooling chamber to water-smoke the brick, and one furnace so placed at the burning chamber as to have absolutely uniform and even distribution of heat. Here either a reducing or oxydizing flame is used, as is required by the ware and the point in its burning that has been reached.

The fuel is producer-gas or oil (natural gas, when obtainable) with combustion maintained by hot air from the cooling chamber, thus having a more complete regenerative or recuperative furnace than is found in even the most modern of steel plants.

The kiln is operated continuously, and the brick are taken direct from the cooling chamber by electric power to the switch alongside of the kiln to a sunken shipping track, where, with a gravity conveyor, they are placed in cars, or taken to the stock piles.

Note the saving in labor at the shale bank, in the clay shed, at the dry-pan, in the setting, sorting and emptying. Note, also, that the plant must run to full capacity—no letting up by the men.

Note the results obtained—brick flashed or not, as required—all one body color, all one hardness, all one size, no kiln marked brick, no bats, *control of color,* and hence no necessity for carrying a large stock.

Note kiln kept at one constant temperature, hence minimum cost of repairs, minimum fuel consumption, minimum labor cost, maximum profits.

This not being a dream—what do you think of it? Will it not almost go your dream "one better"?

DISAGREEABLE DREAMS are not uncommon, even to a man who has a clear conscience. Begging the question of the latter, for a moment, I want to say that your dream—or rather the dream that you published in the October 19 issue, had one or two points, at least, where I disagreed with the dream, or it may be the dream with me.

To begin with, you prefer a slow speed motor connected by flexible couplings to the various units.

While this arrangement is far superior to the usual method of connection it certainly has no advantages of any kind over a properly designed and installed rope drive.

Brick manufacturers and other manufacturers who have rugged, heavy service for their machinery, have been throwing away many thousands of dollars every year on belting, injured motors and other equipment, simply because they have overlooked the simple and efficient connection they might have obtained by the use of ropes.

Five thousand feet per minute is an ideal speed for efficiency in transmitting power by rope, and if there is danger of serious shocks, make your large wheels heavy—to act practically as fly-wheels—which arrangement—together with the movable tightener frame maintaining a positive and equal tension on the various strands of the rope at all times, will absorb the shocks instead of throwing them directly into the driving mechanism.

By using a motor of 720 R. P. M. synchronous speed and a 30-in. diameter sheave you can safely transmit 13 H. P. for each wrap of one inch rope, so that a 100 H. P. motor would only require eight wraps distributed over a face of 18 in. on the sheave.

If you want to be absolutely safe and take care of serious overloads, add 50 per cent to the number of ropes and you still will not take up a large amount of space.

You can mount your driving sheave either directly on the shaft of the motor, or preferably on a short shaft or independent bearings connected to the motor by means of either a flexible coupling or a suitable friction clutch.

Of course, if you still prefer to use a slow speed motor there is no objection other than the cost, and you could use large diameter sheaves and ropes with a less number of wraps.

The cost of a new rope compared to the cost of a new belt will be a mighty pleasant surprise should you have to make a change—which will be very seldom when compared to the belt changes.

Understand—the writer is not objecting to electric motors in general, and no attempt is made to block the onward march of the electric engineer; but he honestly believes that for many brick and clayworking plants a suitable line shaft of fairly high speed, with properly installed rope drives to large individual units, with the smaller ones suitably grouped or belt-driven, will cost you less in original installation and maintenance, show less depreciation, and give as good if not more satisfactory operating conditions, than you could get out of the direct connected or belt driven units in common use today.

ROPE TRANSMISSION PEOPLE FAST ASLEEP

The reason that you do not see more rope drives in clayworking plants today is because the rope transmission people have simply overlooked the clayworking field and the motor men have been right on the job. Also the motors have all been designed to stand 50 per cent or more temporary overload. Belt drives are usually put in at the maximum rates horsepower of the belts in order to make an attractive first cost proposition to the buyer.

So much for your power transmission problem, and the next thing is your elevators.

Of course, there are many cases in clayworking plants where chains (either single or double strand) are preferable to belts, but inasmuch as your "ideal" contemplates the use of belts, we will not discuss the chain type.

Relative to the diameter of pulleys and shaft, practically everything would depend on the distance from center to center of pulleys, and the quantity of material to be handled.

Most installations of elevators in clay plants are not designed by people making a specialty of designing this equipment every day, and the bucket and other equipment usually used are not the best adapted to the purpose.

Many years ago when the grain trade was in its infancy, and bucket elevators were just coming into use, it was "proven conclusively" that elevators must be inclined so that material would fall out of the bucket as it passed over the head wheel. It did not take long to discover the fallacy of this belief, and to show that perfectly vertical elevators were the right thing for grain, because at a certain speed and with a certain diameter pulley and size of bucket, centrifugal force would throw the material from the bucket as it passed over the head wheel.

Today we have developed buckets which discharge grain perfectly with a belt speed of 1,000 ft. per minute; also it might be noted that 200 ft. in vertical height is not uncommon in large elevators.

This height would of course be impractical in general service on an inclined elevator, as it would entail the use of a great deal of expensive supporting equipment and occupy too much valuable space as well as developing excessive strains on the belting.

Generally speaking, the clay man has stepped into the use of elevating equipment without the pioneering that developed the best type of elevator in other lines,—he simply follows the present practice of the grain elevator, which is sometimes right and sometimes wrong for his service.

In most cases it will be found far better to go back to the old original plan of the inclined elevator at a slow speed, using buckets that are more like a box that has the top and one side removed, placed on the belt in such a way that the back of one bucket acts as a spout or chute at the discharge point for the material from the following bucket. The bottom corner of the bucket should have a well rounded filler, so that there would be little chance for the material wedging and packing in the bucket.

Where your "ideal" plant would have 16 in. belt, there should be a bucket 15 in. wide across the belt, projecting 8 in., and being 11 in. deep along the belt.

Your pulley should have a face at least 2 in. wider than your belt, with buckets attached in an unbroken line, and with the belt traveling about 180 ft. per minute, you would have a capacity of approximately 3,000 cu. ft. of material per hour.

Figuring your ground clay at only 60 lbs. per cubic foot you would have a capacity of 90 tons per hour, which would be considerably in excess of the usual dry-pan capacity.

This large capacity is due simply to the taking full advantage of the belt and using buckets suitable to the service.

Furthermore, at the top and bottom would be slatted pulleys so that the material could not pile up on the face of the pulleys and so cause the belts to run off to one side or the other, and endangering belt buckets and other parts as is often the case where solid face pulleys are used.

The heads could be belt driven, but the belts would be narrower and run at a much higher speed than indicated in your ideal in order to get some efficiency out of the belt. There would be a reduction of speed from a counter to the head shaft by means of suitable gears, the latter being enclosed by means of sheet steel or wire mesh guards for the protection of both employees and equipment.

Furthermore, the "safety first" idea would also be carried out on the elevator-head shaft, which would be equipped with a back-stop that would positively prevent the elevator from running backwards thru accident of any kind.

I FIND MYSELF wondering if the "superintendent of one of the largest face-brick plants in the country" really was dreaming when he described the plant that was so vividly pictured in your October 19 issue.

It may be so, but I am led to believe that it was a "waking dream"—that took place when he had his eyes wide open, seeing the wonders of a plant that is built, is running, and turning out good ware. I have reference to a plant manufacturing refractory materials and located in the eastern part of New Jersey.

In the construction and operation of the plant to which I have reference, electricity is the sole source of light and power; the doctrine of "safety first" is paramount from the superintendent to the laborer; even the intercommunicating telephone is daily discharging its functions. The power is 3-phase alternating current of 440 volts and 60 cycles; the pans are elevated, the raw and semi-finished material is raised in belt-tight elevators; the mixtures are compounded automatically with mathematical precision; the double machine units, improved cutting table, drier cars and the utilization of waste heat for drying purposes are all real and accomplished facts.

That portion of your article which relates to the continuous tunnel kiln is of especial interest to me as it vividly describes the kilns in actual operation in the plant to which I have reference.

In continuing this brief description of the plant which realizes the dream of your correspondent, I would say that the ware is burned on cars in two large continuous tunnel kilns, each of a minimum capacity of 16,000 fire-brick per twenty-four hours. These kilns are remarkabe as being the only kilns of their type in this country successfully burning fire-brick at temperatures in excess of 2,500° F.

These kilns are successfully performing their work day in and day out, and have been doing so continuously for years. They are approximately 200 ft. long, being divided into three zones which merge into one another. As the green ware enters the kiln it is gradually heated by the waste gases passing from the combustion zone to the chimney. The temperature of each individual car is raised at intervals of two hours thru the periodic introduction of green material.

The entire process of burning requires but seventy-two hours, a period so brief as to be almost inconceivable to the operator of the old style down-draft intermittent kilns.

The product of these kilns is faultless in quality; the waste of time and money incidental to the reburning of "white" ware is positively entirely eliminated. Furthermore, breakage is an extremely rare occurrence.

It is perhaps unnecessary to remark that the economy of fuel and labor with the continuous type of tunnel kiln is quite phenomenal. This is especially true to the fuel economy, as the heat produced by the combustion of coal is utilized to the fullest possible extent.

After the material is passed thru the high temperature zone it imparts its heat to air which circulates around the cars. A small proportion of the air so heated is consumed in the furnaces as secondary air; the larger portion, however, is available for heating the driers or for any other desirable purpose. As the cars are discharged from the tunnel kilns they may be passed either directly into the storage shed or shipping yard, as conditions require.

As your correspondent is evidently convinced of the non-existence of the plant of his dreams, it may be of interest to him to learn that his dream has materialized and that this same "dream plant" is daily turning out thousands of "first quality," "uniform," "perfect" and "salable" brick.

The Good Work Being Done

by the Department of Questions and Answers is made possible only by the co-operation of our subscribers, who, by submitting their problems to us, not only have them solved without charge, but—

Help Others While Helping Themselves!

Clay Products Considered as Engineering Materials*

A Paper Presented at a Meeting of
the International Engineering Congress, 1915, in San Francisco, Cal.

By A. V. Bleininger, B. Sc.

Bureau of Standards, U. S. Department of Commerce.

(*Continued from the January 4 issue.*)

THE EXTENSIVE USE of vitrified brick for the paving of streets and roads has led to the adoption of rigid requirements for this class of materials. The tests used for this purpose is the so-called rattled test, a standardized tumbling barrel in which ten blocks are subjected to abrasion, both from each other and from cast-iron spheres, the standing of the samples depending upon the loss in weight suffered after one hour's run (1,800 revolutions). After considerable experimental work on the part of the National Paving Brick Manufacturers' Association and Prof. Edward Orton, Jr., of the Ohio State University, standard specifications for the rattler and for the procedure of the test have been recommended.*

The following scale of average loss has been suggested for different requirements.

	General average loss, per cent	Maximum permissible loss, per cent
For bricks suitable for heavy traffic....	22	24
For medium traffic	24	26
For light traffic..........	26	28

Owing to the severity of this test, the absorption and other factors are no longer taken into account for paving-brick.

In the use of paving-bricks, the proper laying of the blocks is of paramount importance. Unless a good concrete foundation is prepared, the sand cushion applied and rolled uniformly, the grouting thoroly done and proper longitudinal expansion joints allowed, even the very best blocks will not result in a pavement of the highest type. It is for this reason that explicit specifications have been worked out with great care by the National Paving Brick Manufacturers' Association and persistently advocated. Given proper conditions of laying, brick streets of magnificent wearing quality will be obtained, such as has been realized in the many miles of brick-paved streets in Cleveland, Ohio, and other cities.

HOLLOW BUILDING TILE AND FIRE-PROOFING

The use, in the form of hollow tile, of larger units than the brick is growing rapidly in the favor of the building public. Of these, a considerable number of sizes are made, without webs or with webs in one or both directions. Interlocking tiles have also come into use to a considerable extent. Two classes of tile may be distinguished, one in which the tiles are placed vertically and one in which they are set in the horizontal position.

These tiles are being used both for bearing and non-bearing walls. For the former purpose, only hard-burned tile can be considered, while soft material is well suited for partition walls. Hollow tiles are particularly useful for enclosure walls of steel or concrete skeleton structures and for stucco work.

The crushing strength of single tiles, hard burned, may vary from 4,000 to 10,000 pounds per square inch of effective area, and the modulus of elasticity from 3,000,000 to 5,000,000. Quoting from specifications proposed by the Hollow Building Tile Manufacturers' Association, "All tiles shall be true, straight and free from objectionable cracks, shall be well burned and of sufficient hardness not to absorb more than 10 per cent of their weight of water in a 48 hour absorption test, and shall have an ultimate crushing strength of not less than 3,000 pounds per square inch of net web area tested * * *". "No tile in any wall shall be loaded, including all live and dead load, so as to exceed 200 pounds per square inch of their bearing members. No hollow tile shall contain any void whose cross section dimension, measured at right angles to the web, is more than 4 inches, and the vertical webs and shells of all tiles used for all bearing walls shall have a thickness of not less than 15 per cent of the measurements across the void enclosed by such shells or webs." * * * "For a one-story building the thickness of the wall shall not be less than 6 inches; for a two-story building 8 and 6 inches; for a three-story structure 8, and beyond the second story 6 inches; for a four-story building, 12 inches for the first and second story, 8 inches for the third and 6 inches for the fourth story."

STRENGTH OF HOLLOW TILE WALL SECTIONS

It is evident that, in construction of this kind, the most important information is obtained from the testing of built-up wall sections and piers. A considerable amount of this work has been done by the National Fireproofing Company and other concerns. In Table VI some results of such work are compiled. For most of these results the writer is indebted to E. V. Johnson, formerly vice-president of the National Fireproofing Company.

From these tests it appears that the quality of the mortar, as was the case with brick, is a most important function. In the examples where lime-cement mortars were used, the addition of cement was quite small. The laying of tiles in the vertical position is greatly facilitated by the use of strips of wire screens, which also impart to the wall a very high degree of rigidity.

The stability of tile walls is very marked indeed and may exceed those of brick walls of equivalent dimensions. In regard to the fire resisting quality of tiles, the same conditions prevail which have been mentioned under the head of brick. Where this quality is to be emphasized, a certain degree of porosity is essential. This applies especially to fireproofing used for the protection of steel columns and girders.

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*Proc. Am. Soc. for Testing Materials, 23, p. 289.

Table VI

Construction of Section	Outside Dimensions, Height, Width, Thickness	Net Area Square Inches	Mortar	Total Maximum Load	Maximum Load per Square inch of Net Area
Two 4-in. tile	7 ft. 7¾ in. x 8⅜ in. x 8⅜ in.	56.0	Cement 1:3	98.81 tons	6,873
Two 4-in. tile	8 ft. 4 in. x 8⅜ in. x 8⅜ in.	56.0	Cement 1:3	141.30 tons	5,065
8x12x8-in. tile	11 ft. 9¾ in. x 36½ in. x 8¼ in.	144.0	Cement 1:3	506,000 lbs.	3,514
8x12x8-in. tile	12 ft. 1 in. x 37 in. x 8¼ in.	144.0	Cement 1:3	346,000 lbs.	2,403
11¾x11¾x4-in. tile	12 ft. ⅝ in. x 35⅝ in. x 8¾ in.	120.6	Lime-cement	136.0 tons	2,255
8¼x16x8⅛-in. tile, cross webs	11 ft. 11¾ in. x 32⅞ in. x 8¼ in.	78.8	Lime-cement	43.5 tons	1,114
12x8x12-in. tile, webs vertical	12 ft. 2½ in. x 36⅝ in. x 8 in.	140.0	Cement 1:3	436,000 lbs.	3,110
12x8x12-in. tile, webs vertical	12 ft. 4 in. x 35 in. x 7¾ in.	80.0	Cement 1:3	154,000 lbs.	1,925
12x8x12-in. tile, 2 transverse, webs horiz	12 ft. 4¼ in. x 36¾ in. x 7¾ in.	60.0	Cement 1:3	80,000 lbs.	1,333
8x8x12-in. tile, side construction	11 ft. 11¾ in. x 32⅞ in. x 8¼ in.	76.0	Lime-cement	43.5 tons	1,144
Four-inch porous tile	12 ft. 6⅝ in. x 34⅞ in. x 3 5/16 in.	56.0	Lime-cement	27.0 tons	964
8x8x16-in. glazed tile, 3 transv., webs vert	12 ft. ¼ in. x 32½ in. x 8 in.	80.0	Lime-cement	84.0 tons	2,100
Double 4-in. partition, hard-burned tile	12 ft. ⅝ in. x 35⅝ in. x 8¾ in.	120.6	Lime-cement	136.0 tons	2,255
Four-inch partition, hard tile	12 ft. ⅝ in. x 35⅝ in. x 4 in.	60.3	Lime-cement	60.0 tons	1,990
Three-inch partition, hard tile	11 ft. 9¾ in. x 34½ in. x 3 in.	46.0	Lime-cement	54.0 tons	2,347
Partition of 4x8½x8-in. tile, plastered	12 ft. 3⅝ in. x 34½ in. x 5 3/16 in.	112.0	Cement 1:3	185.0 tons	3,303
Denison interlocking tile, tile wall, faced with brick	11 ft. x 5 ft. 1 in. x 12½ in.	gross 762	Cement 1:3	686,000 lbs.	....

For this purpose products made from No. 2 fire clays are especially suitable, as they are of a porous nature and, at the same time, a good refractoriness, able to withstand very high temperatures. Very low-fusing clays, vitrifying easily, should not be used for fire-proofing purposes.

The subject of tile floors and arches and of combined tile and concrete construction is a large one and the testing data available are not extensive. The large and successful use of tiles for this purpose seems to speak well for the use of this material.

The excellent thermal non-conducting quality of hollow tiles makes them particularly desirable for residence construction. This statement applies, of course, only to atmospheric temperatures. A hollow-tile wall would not be desirable for furnace walls, owing to rapid increase of heat loss by radiation through the air spaces, with increase of temperature.

Table VII

Crushing Strength of Vitrified Clay Pipe

Nominal Size of Pipe Inches	Number of Pieces Broken	Thickness of Shell Inches	Distributed Vertical Load per Linear Foot of Pipe Pounds
	Standard		
6	9	.72	2,589
6	13	.67	2,638
8	6	.78	1,662
8	5	.822	2,962
8	11	.821	2,843
10	11	.832	3,445
12	5	1.02	1,904
12	6	1.05	3,134
12	6	1.00	3,319
15	6	1.23	3,435
15	4	1.13	2,979
18	6	1.43	2,771
18	3	1.26	2,504
18	11	1.18	2,768
20	4	1.29	2,754
20	12	1.32	2,414
24	6	1.48	2,334
24	5	1.46	2,938
24	10	1.48	2,377
	Double Strength.		
12	6	1.26	3,916
15	5	1.45	4,710
15	6	1.36	4,414
18	5	1.56	4,077
18	6	1.52	4,216
20	6	1.72	4,119
20	4	1.76	3,117
24	3	2.02	4,334

ARCHITECTURAL TERRA COTTA

What has been said of the strength of burnt clay in the form of brick and tiles applies also to terra cotta, which might be said to be midway between these two kinds of product. The data available in regard to this subject are quite meager. The subject of the strength of terra cotta is not very important, inasmuch as this material is used principally for facing purposes, altho it is nearly always well burned and of excellent strength. It is generally made from No. 2 fire clays, and, with an absorption of 10 per cent, shows an average crushing strength of not less than 4,000 pounds per square inch. The resistance to weathering of the glazes and enamels is to be considered, and it is essential that the covering slips and glazes be firmly united to the body of the ware and that the enamels be sufficiently resistant to make them sufficiently weatherproof. Freezing tests of terra cotta would be very desirable and an acid test would gauge the resistance of enamels to atmospheric influences.

SEWER PIPE AND DRAIN TILE

Sewer pipe, to serve its purpose most successfully, should be composed of a strong, practically vitrified body showing about 4 per cent absorption and should be well glazed. Pipe is invariably subjected to external pressure, due to the weight of the material above it, which in the case of wet clay at a depth of 10 feet or more amounts to 69 per cent of the total superimposed weight, according to the conclusions of F. A. Barbour*. The heaviest loads to which sewer pipe may be subjected are produced by trucks and steam rollers. Mr. Harrison P. Eddy† estimates the pressure which may thus be produced in the case of a steam roller at about 6,500 pounds per linear foot of trench. This investigator calculates that about 25 per cent of this load is applied over the full width of the trench at a depth of nine feet.

F. A. Barbour proposed a formula for the required thickness of sewer pipe as follows:

$$t = 1.65\sqrt{\frac{pd}{c}}$$

where t = thickness of shell in inches,
p = pressure per linear foot in pounds,
d = internal diameter of pipe in inches,
c = constant = 33,000.

It was assumed by him that the estimated tensile strength of clay is 900 pounds, and the compressive strength 6,500 pounds per square inch. He recommended that standard pipe be designed for a breaking load of 3,000 pounds and double-strength pipe for a breaking load of 4,500 pounds per linear foot. Similar results are obtained by the use of the general formula for pipe by Talbot††.

$$t = \frac{1}{4}\sqrt{\frac{6wd^1}{f}}$$

where t = thickness of shell in inches,
w = total distributed vertical load in inches,
d^1 = mean diameter in inches = internal diameter + thickness of shell,
f = ultimate tensile strength in pounds per square inch in outer fibre,
using the values employed by Barbour.

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*Jour. Assn. Eng. Soc., 19, p. 193.

†Report of Committee C-4, The American Soc. for Testing Materials.

††Jour. Assn. Eng. Soc., Dec., 1897.

In Tables VII and VIII, results of crushing strength determinations of sewer pipe are given. The first of these tables represents results obtained by F. A. Barbour*, the second, determinations by the Testing Laboratory of the Bureau of of Sewers**, Brooklyn, N. Y. In the latter, the tests were made with pipe in a box containing sand. The pressure was applied through a wooden knife edge.

Table VIII

Crushing Strength of Vitrified Clay Pipe

Nominal Size Pipe Inches	Total Number Tested	Average Pressure Lbs. per Lin. Ft. of Pipe	Highest Result Lbs. per Lin. Ft. of Pipe	Lowest Result Lbs. per Lin. Ft. of Pipe	Bureau Standard Required Pressure Lbs. per Lin. Foot
6	170	1,537	2,333	1,033	1,000
12	245	1,542	2,900	933	1,150
15	 72	1,935	2,800	1,300	1,300
18	 25	2,389	3,100	1,734	1,450
24	 17	2,825	3,800	2,200	2,000
30[1]	 2	3,260	3,280	3,240	....
30[2]	 2	3,160	3,240	3,080	....

With reference to the thickness of pipe, Fruehling gives as the German practice the relation $t = \frac{d}{20} + 0.39$ inches,

where t = thickness of pipe shell in inches,
d = internal diameter of pipe in inches.

Pipes from 9 inches in diameter upwards are usually made in two thicknesses, 1/10 and 1/12 of their diameter.

Table IX

Summary of the Mean Minimal, Maximal and Average Values for Resistance Against Internal Pressure With Vitrified Clay Pipe.

Av. Internal Diam. (In.)	Av. Thickness of Shell (In.)	No. of Individual Tests	Internal Water Pressure in Atmospheres. Av. Min.	Av. Max.	Total Av.	Ultimate Av. Tangential Stress (Lbs. Sq. In.)
2	0.72	3	24.0	28.0	26.1	490
3	0.80	3	15.0	18.4	16.3	490
4	0.80	11	9.2	25.2	20.1	830
4	0.68	23	8.3	24.5	17.2	850
6	0.80	23	8.3	24.5	17.2	850
8	0.92	13	14.6	24.2	17.9	1,120
10	0.96	2	6.0	8.0	7.0	600
12	1.04	19	6.7	16.9	11.9	920
16	1.12	2	9.4	9.7	9.6	910
18	1.28	8	7.1	12.0	9.3	920
20	1.44	4	9.0	12.2	10.6	1,040
24	1.72	7	6.3	8.6	7.2	720
28	1.88	4	7.1	10.2	8.7	910
32	1.96	14	5.4	9.0	7.7	1,120
Average	......	......	......	......	13.9	850

Work has been done along this line by Professor M. A. Howe† at the Rose Polytechnic Institute and Burchartz and Stock at the Royal Testing Laboratory, Gross-Lichterfelde.†† In the work by Howe, the averages for the different products varied from 265.6 to 1081.8 pounds per square inch. The general average of all the results is 600.4 pounds per square inch. The ultimate average tangential stress in the German results varied from 490 to 1,120 pounds per square inch, and the total average internal water pressure from 7 to 26.1 atmospheres. The average water pressure resulting in failure was 13.9 atmospheres; the ultimate average stress, 850 pounds per square inch. The results of Burchartz and Stock are given in Table IX.

(To be Continued)

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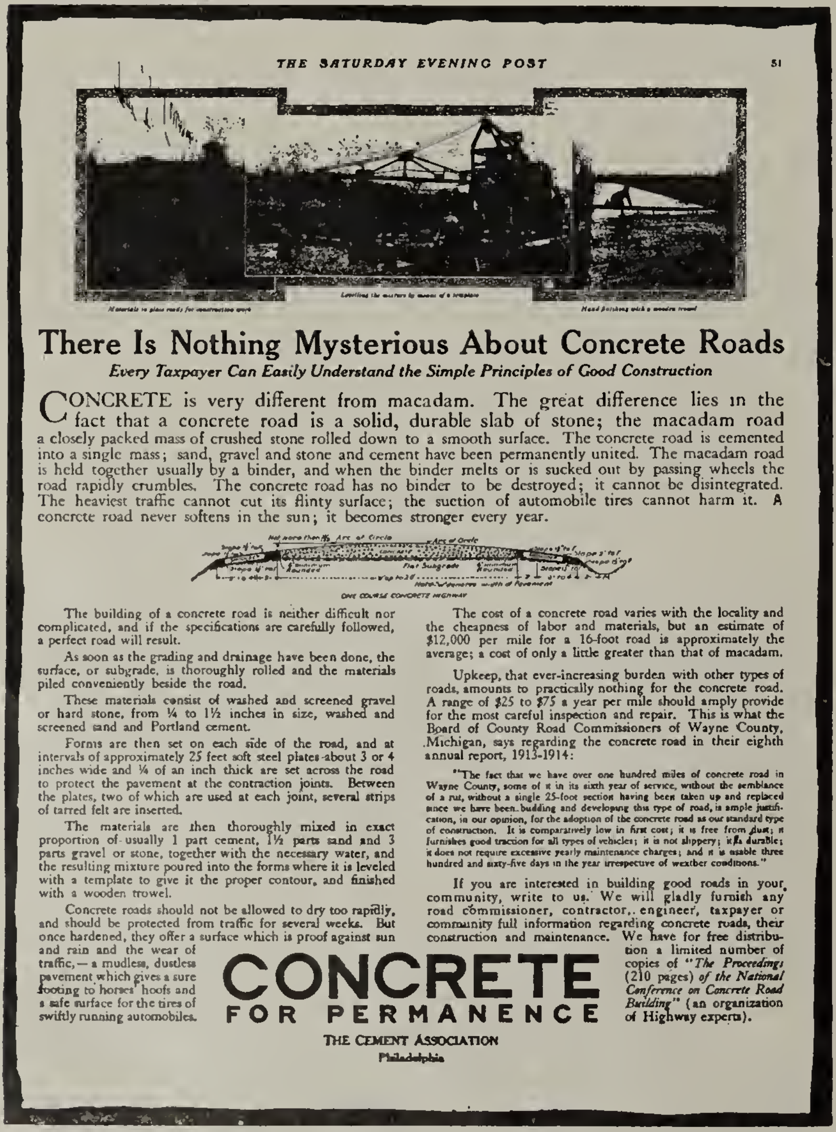
*Jour. Assn. Eng. Soc., 19, Dec., 1897.
**Munic. Jour. and Engr., 28, Feb., 1910.
†Journ. Assn. Eng. Soc., June 1891.
††Eng. Rec., 54, p. 193.



THE SATURDAY EVENING POST 51

There Is Nothing Mysterious About Concrete Roads

Every Taxpayer Can Easily Understand the Simple Principles of Good Construction

CONCRETE is very different from macadam. The great difference lies in the fact that a concrete road is a solid, durable slab of stone; the macadam road a closely packed mass of crushed stone rolled down to a smooth surface. The concrete road is cemented into a single mass; sand, gravel and stone and cement have been permanently united. The macadam road is held together usually by a binder, and when the binder melts or is sucked out by passing wheels the road rapidly crumbles. The concrete road has no binder to be destroyed; it cannot be disintegrated. The heaviest traffic cannot cut its flinty surface; the suction of automobile tires cannot harm it. A concrete road never softens in the sun; it becomes stronger every year.

The building of a concrete road is neither difficult nor complicated, and if the specifications are carefully followed, a perfect road will result.

As soon as the grading and drainage have been done, the surface, or subgrade, is thoroughly rolled and the materials piled conveniently beside the road.

These materials consist of washed and screened gravel or hard stone, from ¼ to 1½ inches in size, washed and screened sand and Portland cement.

Forms are then set on each side of the road, and at intervals of approximately 25 feet soft steel plates-about 3 or 4 inches wide and ¼ of an inch thick are set across the road to protect the pavement at the contraction joints. Between the plates, two of which are used at each joint, several strips of tarred felt are inserted.

The materials are then thoroughly mixed in exact proportion of-usually 1 part cement, 1½ parts sand and 3 parts gravel or stone, together with the necessary water, and the resulting mixture poured into the forms where it is leveled with a template to give it the proper contour, and finished with a wooden trowel.

Concrete roads should not be allowed to dry too rapidly, and should be protected from traffic for several weeks. But once hardened, they offer a surface which is proof against sun and rain and the wear of traffic,—a mudless, dustless pavement which gives a sure footing to horses' hoofs and a safe surface for the tires of swiftly running automobiles.

The cost of a concrete road varies with the locality and the cheapness of labor and materials, but an estimate of $12,000 per mile for a 16-foot road is approximately the average; a cost of only a little greater than that of macadam.

Upkeep, that ever-increasing burden with other types of roads, amounts to practically nothing for the concrete road. A range of $25 to $75 a year per mile should amply provide for the most careful inspection and repair. This is what the Board of County Road Commissioners of Wayne County, Michigan, says regarding the concrete road in their eighth annual report, 1913-1914:

> "The fact that we have over one hundred miles of concrete road in Wayne County, some of it in its sixth year of service, without the semblance of a rut, without a single 25-foot section having been taken up and replaced since we have been building and developing this type of road, is ample justification, in our opinion, for the adoption of the concrete road as our standard type of construction. It is comparatively low in first cost; it is free from dust; it furnishes good traction for all types of vehicles; it is not slippery; it is durable; it does not require excessive yearly maintenance charges; and it is usable three hundred and sixty-five days in the year irrespective of weather conditions."

If you are interested in building good roads in your community, write to us. We will gladly furnish any road commissioner, contractor, engineer, taxpayer or community full information regarding concrete roads, their construction and maintenance. We have for free distribution a limited number of copies of "*The Proceedings* (210 pages) *of the National Conference on Concrete Road Building*" (an organization of Highway experts).

CONCRETE
FOR PERMANENCE

THE CEMENT ASSOCIATION
Philadelphia

This Advertisement, Occupying a Full Page in the "Saturday Evening Post," January 15, 1916, Cost the Cement Association, a Promotion Bureau for Cement-Concrete, Five Thousand Dollars

Five Thousand Dollars Worth of Cement Advertising

Some time since, a man supposedly well versed in the politics of road building, said that the "cement people" were beginning to find out that promoting cement roads did not pay. He predicted that, within a very few years, we would not hear anything more of the cement-paved road, and that cement would be content to take what came to it as a foundation and grout for paving-brick.

The illustration printed herewith, however, tells a different story. Space in the "Saturday Evening Post" is not cheap, as anyone who has had occasion to inquire, has found. A few months since, *the rate was Five Thousand Dollars a page, per insertion*. If there has been any change, it is more than that, today.

It may be that the "cement people" have made up their minds not to spend so much money on personal demonstration. It may be that they believe printers' ink will do more for them than an army of salesmen.

In any event, the fact that they are willing to spend *Five Thousand Dollars for one advertisement* ought to make the owners of paving-brick plants do some hard thinking. It should, too, make them see the wisdom of joining some such organization as the National Paving Brick Manufacturers' Association, and of contributing to its advertising fund so liberally that some day similar advertisements will appear, setting forth the economy of brick roads.

"Buying Well"

Actual Happenings in Clay Plants Where the "Economy of Buying Well" Has Been Convincingly Demonstrated

YOUR experience in purchasing machinery and equipment is, in all probability, entirely different from that of other clay plant owners. For that reason, it will interest them—just as the "stories" told below have interest for you.

Won't you contribute your share to a great movement for the betterment of the industry, by writing us a letter on the subject of "Buying Well"?

EDITOR'S NOTE: The man with the lowest production cost is intrenched against the invasion of cut-price competition. Good machinery and good management go hand in hand, one being useless without the other. The profits of many a clayworking plant have been thrown away by the false economy of someone who believed he was "getting a bargain" when, in fact, he was paying a price out of all proportion to the value of the equipment he was purchasing.

The Story of an Auger Machine that Could Not Increase Its Own Capacity

An interesting tale with a good moral centers around an incident that happened a year or so ago, on a well known plant.

During the early part of January, a new auger machine was purchased which had a guaranteed daily capacity of 40,000 brick. The new machine, to use a common phrase, was a "dandy"—modern in very respect from its cut gears to the base. But a false economy lay in the thought that it would do twenty-five per cent more work than it was designed for, and thereby enable the manufacturer to "get along" with this machine which was, of course, lower in price than one which would make 50,000 brick a day.

A week passed—two weeks—and it was soon discovered that the machine was not delivering enough brick in nine hours to keep the plant up to its normal capacity, which was 50,000 brick. After much effort, the output was "boosted" to 48,500, but still this was not enough. The plant must produce 50,000 brick each day in order to show a reasonable profit. Every known device was tried to get the additional 1,500 brick. The speed of the machine was increased. The clay was run wet and then stiff. The taper of the die was reduced, but of no avail.

One morning, about three months later, the superintendent led a gang out to a flat car on which reposed a new auger, much larger than its predecessor and easily able to make 60,000 brick per day.

If the larger machine had been purchased in the first place, it would have saved the "junking" of a machine that cost nearly as much to install, not to mention the time and labor wasted in attempting to make the smaller machine do something that was physically impossible.

The Story of a Salesman Who Had a Noisy Foreign Accent and a Poor Fire Extinguisher

The salesman who is a "marvel of efficiency" is all right when he is selling something *for* you, but when he is selling *to* you, it is well to let a period of solemn and lonesome thought come between the end of his "spiel" and the actual affixing of your name to the dotted line on his contract; or, as is more usual, your saying, "Well, make it so and so, and I'll give you the order right now."

The reason for solemn and *lonesome* thought is the chance it gives you to come out from under the hypnotic influence of the salesman. The man who said that a real salesman could sell anything, from a paper of pins to a parcel of real-estate, was not so very far from wrong. Also may a "real salesman" of the type described, sell something that he isn't at all sure is the right thing for the purpose. In other words, while seemingly selling his machine or device, or material, he is, in reality, selling *you*.

The writer has in mind a *great sound* that entered the office of a well known brick manufacturer one day in midsummer. It barely preceded the appearance of an exceptionally well dressed, good looking, foreign accented salesman, who had fire-extinguishers for sale. He had shot off the first lines of his sales-talk to the company dog, a hunting dog of the entomologist breed.

Then the bookkeeper had capitulated to the torrent of peculiarly pronounced words and the way was clear to the manager's office, in which the writer sat smoking a peace-pipe with the man who did all of the buying.

Wasting no time (and, as it turned out, no words) on any preliminary, that salesman proceeded to demonstrate his fire-extinguisher, bringing it down with a resounding thump on the floor, to illustrate how, when the time of danger came, the proud possessor of one of these, would, by jerking it off of its hook, start a chemical process—absent in the sample—that would give a sure-fire protection against the spread of flames.

The writer fled to where the bookkeeper and he could enjoy the luxury of a laugh at the torrent of language and the series of thumps. Then came a silence, and the foreigner walked out, leaving a series of "good-byes" in his wake.

The manager had bought two. They came, in a few weeks, express collect, and with a bill. *They were never taken out of the boxes that contained them.* The directions accompany them warned that they would be useless if frozen. The only places where they could have been used was where they could not be protected in cold weather.

The Story of a Superintendent Who Knew More Than a Catalog

Business was good and five new round down-draft kilns were being erected at the plant. When it came to ordering the bands and lugs for these kilns, the superintendent, whom we presume had the interests of his employers uppermost in his mind, was inspired to show a saving on the purchase of this equipment. With the utmost confidence in his ability as a buyer, he spurned the suggestion of the catalog and ordered bands and lugs that were designed for much smaller kilns, and, of course, at a lower figure.

In a short time, the material arrived and was installed on the kilns, which were immediately set and the fires lighted.

The first kiln to heat up, broke the bolts on the two top bands, the crown gradually settling down on the ware. The second kiln fired would have done the same thing had not the tops been continually loosened. The bolts on this kiln were saved from breaking only by close inspection and untiring vigilance. Finally, before the ware was burned, it became necessary to put out the fires to save the kiln.

Of course, the manufacturer of the bands and lugs was blamed. Accordingly a hot letter was sent by the superintendent to the firm manufacturing the material.

The next mail brought a reply, showing why larger and stronger bands should have been ordered, the method of placing them and their treatment during the first fire.

The writer is unable to recall the exact loss incurred because of the cheap bands, but in the ruin of one kiln and the discarded bands, $900 were easily lost. This does not take into consideration, the loss of the market price on the unburned contents of the two kilns, to say nothing of the coal and labor wasted which ran the bill for "buying cheap" to something in the neighborhood of $1,500.

The Story of a Waste Clay Conveyor That Carried the Waste Into the Bank Account

On a certain clay plant it was the custom to allow the green brick that the "take off" boys were unable to handle, to pile up at the end of the offbearing belt. At intervals it was necessary to detach a man from some other important work and have him load this waste into a wheelbarrow, take it to the pug-mill and shovel it into the machine.

It was figured that this method of disposing of the waste was costing in the neighborhood of $420 a year, so it was decided to build a waste-clay conveyor under the floor, which would terminate in an elevator to the pug-mill.

As the first step in this direction, the superintendent brought out a discarded four-inch belt, about eighty feet long. He then had some idlers turned at a local woodworking shop. Two new end spiders, gears, and so forth were bought. For the elevators, sheet-iron, bent at right angles was used for the buckets, these being attached to an old six-inch belt.

Finally the new conveyor was completed. It screeched in a sharp falsetto if even ten brick started to ride, but "quit cold" if one of these brick presumed to ride sideways, for the clay would clog up the belt, which, with a few spasmodic jerks, "gave up the ghost."

To bring the tale to a speedy end, today a large capacity, silent belt and elevator have replaced the former "child of the junk pile," giving no trouble whatsoever. But the memory of wasted hours, lost temper and expended cash on the first conveyor still lingers—a lasting lesson in "Buying Well."

The SALESMANAGER

A Department Devoted to the Marketing of Burned Clay Products—Particularly Those That Enter Into Building and Road Construction, Sewers and Farm Drainage

IT generally pays to get into personal contact with the man who wants to act as your sales representative. A similarity of name may give a Bradstreet or Dun rating. Read what one "Brick and Clay Record" subscriber has to say:

"Late in 1912 we employed as a salesman a man who had devoted his earlier years to other work. His duties were carefully selected, that he might not meet with discouragement, and also that the mistakes he might make would be of comparatively little importance—the latter that we might not suffer thru his inexperience. Yet we wanted to give him every chance to develop.

"During this course of entered apprenticeship, he was given an inquiry that was mailed from this city to a large producer of face-brick, whose agency we had at the time. The inquiry asked for the sales-agency of this well known brick, and for this district.

"Our apprentice salesman tried three times to locate the writer of the inquiry, whose stationery showed him to be in a business not directly connected with building material. The salesman finally turned in a report that he was unable to locate the man he was looking for.

"We naturally told the salesman that the man must be at, or near the location shown on the letter-head, as the correspondence was very recent. The salesman made a renewed and determined effort, and located his man. This is the report he turned in:

"'Concerning inquiry of .... regarding an agency or position as salesman, beg to report that after much difficulty, he was found hibernating in a small, filthy and foul-smelling third-story room at No. .... Street, in the company of cock-roaches, bedbugs and possibly other vermin. He is probably a man fifty years of age, under-sized, unshaven, tobacco-stained and whiskey-soaked. He modestly admits that he is the best salesman in these United States, and to prove that he is no impostor, related incidents in his career to substantiate his admissions of ability that would make the average high-class salesman look like a piker. I would advise that Mr. .... be advised of our inability to employ so great a celebrity.'"

Where Form Letters Fail

A magazine that is devoted, for the most part, to business-letter writing, and which furnishes ideas for collection and follow-up correspondence, recently had occasion to write several very personal letters to a subscriber from whom it found it difficult to collect.

This subscriber waited until he had received about a dozen letters, some hot and some cold, some pleading and some demanding—every conceivable style of collection-letter writing.

Then he replied somewhat as follows: "I have taken a great deal of pleasure in reading the letters you have sent me during the past two or three months, and in which you tried to collect the amount that you claim I owe you. I notice that none of these letters are the same, or similar to the letters that you publish in your magazine, and which are supposed to be models. Maybe that is the reason why the ones you are writing me have not had the desired effect. Anyway, I am inclined to wait and see if you can write a letter that will make me pay. If you can do that, I want to use the same form on some of the people who owe me money. I tried some of the letters published in your magazine, but they didn't bring home the bacon."

Sound Proof Walls in Hotels

It would be a splendid thing if architects would give more thought to the interior walls and floors of hotels. They make them "fire-proof" when compelled to, but they seldom, if ever, make them sound-proof.

A paper that has a wide circulation among hotel people is making a campaign for more comfortable hotels—saying truly that the man who goes to a hotel wants to receive as great an amount of comfort as it is possible for the proprietor to give for the money.

One of these comforts certainly is "quiet." And the hotel that gives the most "quiet" for the least money is apt to do a good business while rival hostelries complain of hard times.

The telephone that rings in the next room—the conversation that assails the would-be sleeper from the other direction—the pounding of the counterweight on the elevator, that always has its sliding place somewhere near the head of your bed—the pounding of the steam pipes and the bangity-bang of the water pipes, all of these are the unnecessary evils of living in a hotel.

If these were overcome—as they would be, in great measure, by hollow-tile partitions and hollow-tile floor arches—the hotel man could advertise his as a *sound proof hotel,* as well as fire-proof.

It would not take long for the extra business, obtained solely on the "quiet," to pay for the extra cost of this type of construction. Put it up to the architect on the next hotel that is built in your town.

The Passing of the Stucco House

There has not been a time in twenty years when manufacturers of brick, both face-brick and its humbler brother of the backing wall, and their blood relations, burned clay building tile and architectural terra-cotta, ought to be advertising *in a large way* to reach the builders in New England, as comes to them today, at the opening of a new year.

The concrete-cement-stucco fad of a few years ago has brought about a peculiar condition. Indirectly, it has aroused a great demand for burned clay building materials.

J. F. Whitcomb, the Winthrop builder, has just erected a fine residence for a wealthy citizen of the Fisher Hill district in Brookline, Mass. In order to satisfy the rigid taste of the owner, who said that he wanted something "out of the ruck of the everlasting concrete imitation of Heaven only knows what" worked to a design that was literally the New England farm-house of the beginning of the last century. It was, like the houses it reproduced, constructed solidly and solely of brick. The original design, of course, came from England, and the Puritans improved on the English in making their buildings even more solid than the English counterparts, with an idea of having them endure the terrific New England climate.

This residence, which can be found at the corner of Boylston Street and Fisher Hill Avenue, is solid brick, with brick copings and window ledges, the walls at the ends running clear to the roof—all brick. Even the fences are of brick.

The people with money to spend—the people who are willing and able to pay for what they get—are asking for brick. The message of brick has gone home! And this has been accomplished more by the brickwork of the past ten years than by any amount of publicity given to the "economy of using brick."

The man who builds a home wants it to say something of its owner's social, mental and artistic attainments. When the concrete-cement-stucco absurdity first hit New England, it had the doubtful virtue of newness. Little was said about its cheapness. The early stuccoed houses were not cheap. The trouble was that it did not give much of any scope to individuality. Later it covered about all of the individuality it had to offer, in its appalling sameness of dirty, dingy, cracked and falling-to-pieces walls.

The advertising slogan of the brickmaker of today—that is, the slogan that will appeal to the home-builder of New England—is the *beauty* of brick. The sub-head and follow-lines should tell of its flexibility—its ease of adoption to every design and its faculty of accenting the artistic taste of the owner and the architect. The next argument in line is its *everlastingness*—its ability to stay clean and to preserve its beauty despite the ravages of the dust that blows and the rain and snow that beats upon it.

Let cheapness go for awhile! The shoppers with charge accounts are not to be found in the "bargain basements."

Where the Face-Brick Man Overlooks a Bet

In the November 13 issue of the "California Tourist and Hotel Reporter," the leading editorial lands a blow for face-brick that ought to help that branch of the industry—at least in places where the "California Tourist" is read. The editorial reads, in part:

"A question which has probably never occupied the minds of hotel men, hotel architects and hotel builders to any appreciable extent, recently smote the editor right between the eyes. Why are hotel courts so cold and bare—so utterly devoid of ornamentation, while the walls of the rooms and corridors are invariably tinted in soothing tones, hand painted, papered or overlaid with wood panel—or upholstered?

"In the case of the interior decorating, as with the facade of the building, the object very evidently is to please the eye of the guest.

"Now then, many of these guests must, of necessity, occupy court rooms. Why should they be condemned to gaze upon the bleak, barren walls of the court, upon which no attempt has been made toward architectural or colorful beauty?

"Is it because the courts are not made conspicuous in the architects' drawings, and therefore are not reproduced in the trade press or the daily papers? Or is it that the popular impression of these courts is still along the lines of the old 'light shafts' that had to be whitewashed every spring, in order that any daylight at all would find its way into some of the 'inside rooms'?

"It would be interesting to try the experiment of using the same facing material on the court walls as is used on the street side of the building—and to pay as much attention to the architectural detail of the court walls as is paid to those that face the thorofares.

"The man who pays for his room is entitled to at least as much consideration as the man who walks or rides by."

The SUPERINTENDENT

A Department Devoted to the Plant, Beginning at the Pit or Mine and Ending at the Loading Track With Crisp Comments Made by the Way

A SAVING of nearly twenty-five horsepower on a one-hundred and fifty horsepower line shaft by a reduction in bearing friction, is, to say the least, an attractive cut in operating costs. A hollow-ware plant in Iowa is to be given the credit for this remarkable accomplishment, roller, instead of metal alloy, bearings being the means to this end.

Alloys are in common use as bearings in place of wrought iron, cast iron or steel, partly because wear and friction are believed to be more rapid when two metals of the same kind work together; partly because soft metals are more easily worked into the proper shape; and partly because it is desirable to use a soft metal which will take the wear rather than a hard metal which will wear the journals more rapidly. A good bearing metal must have five characteristics:

1. It must be strong enough to carry the load without distortion.

2. It should not heat rapidly. The old copper-tin bearing, made of seven parts of copper to one part of tin, is more apt to heat than some of the softer alloys. In general, research seems to show that the harder the bearing metal, the more likely it is to heat.

3. Good bearing metal should work well in the foundry. Oxidation while melting causes spongy castings.

4. Good bearing metals should show small friction, but the wide latitude between a good and bad bearing, owing to mechanical difficulties, leaves plenty of room for a waste of power thru unnecessary friction.

5. Other things being equal, the best bearing metal is that which wears slowest.

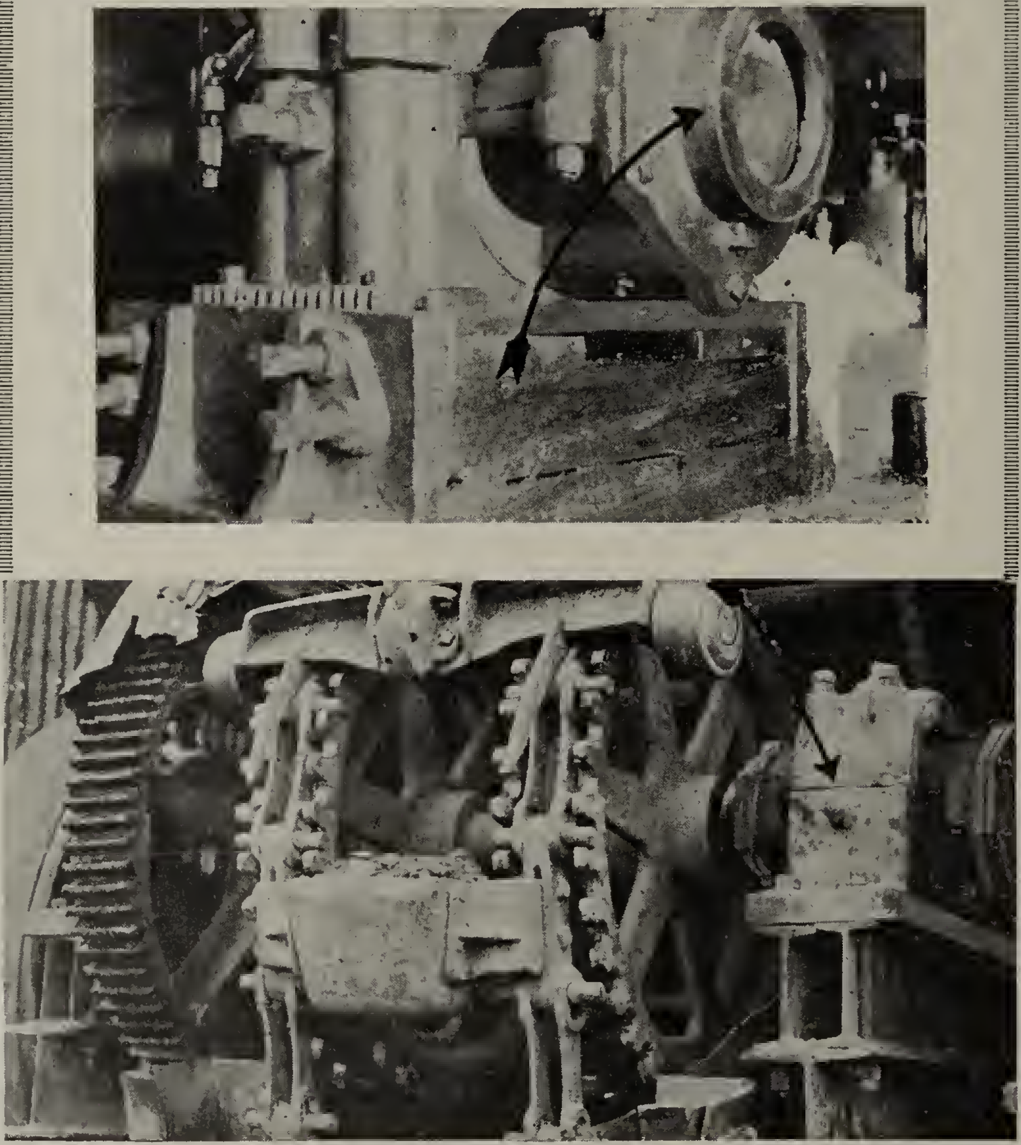
From the above requirements, it can readily be seen that the difficulties attending the securing of a mechanically perfect metal alloy bearing are many. One of the greatest drawbacks to a bearing of this character is the frequent replacements necessary, and due to wear, especially on heavy duty machine. Considerable lubrication is always needed and the metal alloy bearing must be watched to see that it does not get too hot, due to the low melting point of the metal used. Then, again, the skill required in pouring a metal alloy bearing is considerable, proper alignment of the shaft and the adjustment of journal clearance being important items.

The advent of roller bearings, however, has done much to eliminate these troubles. On the Iowa clay plant, mentioned in the opening sentence of this article, an accident to the main shaft bent it slightly. At the time of this mishap, babbitt bearings were used on the shaft and were continued in service for some time thereafter. But there was constant trouble. It was finally decided to make a change, substituting roller bearings. When this was done, the shaft ran for three years without the slightest trouble, until it was finally renewed, when the plant was overhauled recently.

At this plant, roller bearings are also used on the fan which exhausts the waste heat from the kilns into the drier. Babbitt bearings were formerly in use at this point, the fan requiring about sixteen horsepower to operate. Now, that these have been replaced with roller bearings, this fan requires less than thirteen horsepower. The new bearings were installed chiefly because at night the temperature of the waste heat exhausted from the kilns would often reach a temperature of four hundred degrees Fahr., making it difficult to keep the fan shaft lubricated. The babbitt bearings would often run dry and then hot, finally melting and causing from one-quarter to a half day's delay while new bearings were being installed. In addition to these difficulties, the babbitt bearings were water cooled. Being in an exposed location, the water would often freeze during the winter and cause trouble and delay in thawing. Every time one of these delays occurred it meant that progress in the drier was brought to a

WHERE ROLLER BEARINGS ARE MAKING GOOD

The Upper Picture Shows the Journal Box, Containing Bearings, on the Shaft of a Drier Fan, and the Lower Picture the Top of a Heavy-Duty Shale Planer Where Bearings Are Used



standstill, delaying the kiln setters and causing no end of trouble. Now, all of these worries have been eliminated by the installation of roller bearings at the vital point.

On the shale planer at this plant, which was described in the columns of this magazine about six months ago, a twenty-five horsepower motor is used for driving the knives and buckets which cut forty tons of material in an hour. Babbitt bearings were formerly used on the shaft driven by this motor. These have since been replaced with roller bearings, effecting a saving of fifteen per cent in power. This shaft, which is shown in an accompanying illustration, is often called upon to take some very heavy shocks in cutting the rock face. The roller bearings seem to absorb these shocks very well, altho the downward pressure is from 20,000 to 30,000 lbs. when the machine is cutting thru rock.

An electric locomotive, shown in an accompanying illustration, is also in use at this plant, pulling a clay car with a capacity of seven tons from the pit to the shed at a speed of about ten miles an hour. The bearings formerly used on the axles of this locomotive were of the metal alloy type, which had to be replaced each year. Roller bearings have been substituted which have been in use for nearly four years, never causing a minute's delay in all that time. Furthermore, owing to the presence of roller bearings on the axles of this locomotive, it is able to coast from the clay shed to the pit, a distance of one-half mile over a slight grade, without using any power.

The superintendent at this plant has found that roller bearings average about forty per cent more in cost than babbitt on initial installations, but with a little oiling, they will never get hot. They can carry a heavy overload and not cause trouble, thereby saving much more than their first cost in a short space of time.

Some Good Winter Advice

Many expensive and sometimes disastrous fires are caused by ill-advised attempts to thaw frozen water-pipes. Here are some "rules" that it might be well to copy and tack up at every place on the plant where the pipes are exposed, and where thawing would be attempted in case of freezing:

DO NO USE OPEN FLAME.

In thawing water-pipes, never use a burning match, a torch or open flame of any description. To wrap the pipes with oil soaked rags and then set them on fire is worse than folly—*it is incendiarism.*

This pipe is so located that there is an ascending current of air to feed and spread a flame.

Wrap the frozen section with cotton cloth and pour hot water upon it until the ice in the pipe gives way.

Rags on the floor at the base of, or under the pipe will absorb the waste water.

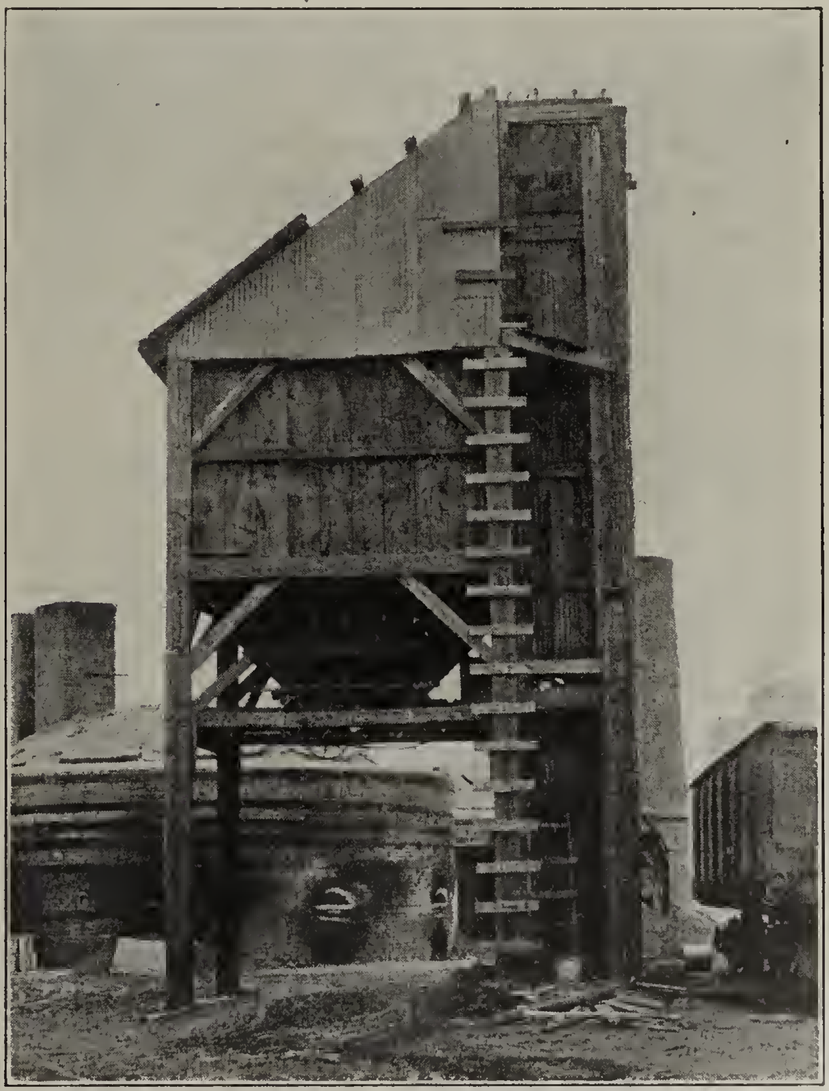
If the freezing is too severe to yield to this treatment notify the office and wait for instructions.

A Cost-Saving Method for Handling Coal

Showing an actual saving of one dollar per day, the coal hopper in the accompanying illustration has paid for itself in less than two years and is now making money for the owner of the Iowa plant upon which it stands. Not only that, it has been a great help in systematizing the handling of coal for the kilns and the power plant, together with the disposal of culls from the kilns that are being unloaded, by enabling one man to take care of all of this work.

The construction of the hopper is simple. On the side facing the switch track a bucket elevator was placed with a capacity of twenty-five tons in one hour. When a car of coal is received, it is immediately unloaded, requiring not more than an hour for this operation. The men are then released for other work, leaving one man to take care of the coal carting. A two-wheeled dump cart is used which is driven under the hopper. The gate at the bottom is then opened and the cart loaded without the necessity of the driver leaving his seat. When filled, he simply closes the gate and drives on to his destination.

Obviously, he is able to handle more coal than is needed at this ten-kiln plant, and so, in his spare moments, he is employed removing the culls which are discarded by the men who are emptying the finished kilns.



The cost of this hopper was a little less than five hundred dollars. It is forty-two feet high above the top of the rail, and has a capacity of thirty tons.

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Questions

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Address all communications intended for this department to "Editor, Questions and Answers," care of "Brick and Clay Record," Chicago.

Adding Roof to Increase Drier Capacity

731. *Iowa—I have a twelve-track drier which works very satisfactorily in warm weather but in cold weather the single roof which I have is too closely in contact with the outside atmosphere and causes dripping of water on the tile. I have experienced a great loss in the checking of the tile this fall on account of the trouble mentioned and know that to work early and late I must build a second roof or ceiling. Now, understand me, my drier roof clears the tile overhead about six inches. Would it not be a good idea to raise that roof about eight feet, putting in a tight floor where the roof now stands and using the upper part for drying also? I contend there is enough heat radiating off of the present roof to dry tile up above it and yet not enough to check them. If this be true, I can almost double my drying capacity and could afford to build another kiln.*

There is every reason to believe that the plan outlined is perfectly practical and that it will increase the drying capacity very considerably. The tight floor should be made of as thin a material as possible and yet be strong; upon its conductivity (to heat) will depend the efficiency of the drying in the space over the present tunnels. Care should be taken that there are plenty of windows on this second story as well as roof ventilation because the same trouble will be encountered here as is found in the present tunnel—the condensation of moisture on the under-side of the roof and consequent dripping water on the ware. This can be avoided only by providing plenty of ventilation.

Regarding Electrical Installation

730. *Iowa—We are very seriously considering the electrification of our plant and in this connection would like to have you give us some information on a few points, concerning which there is some doubt in our minds. First, which is preferable—direct or alternating current? Should motors be direct connected to the machines or belted? Should there be a motor for each machine or a motor for each group of machines or will one motor do for the entire plant?*

If accurate information is desired (and no other kind of information is worth anything) on the above questions, it will be necessary to call in a sales-engineer of one, or more, of the reliable electrical machinery manufacturing firms. This service we know is gratis and entails no obligation.

Pending your correspondence with electrical companies, we give you a general discussion of your questions: the selection of the class of motor, viz. D. C. or A. C. depends entirely upon conditions at your plant. If you buy your power from a central station it will be A. C. and will, under ordinary circumstances, require the use of a transformer to step

& Answers

Recognized Authorities in Every Line of Clayworking, Engineering, Economics and Technology Will Write the Answers

Should a reply be desired by letter, send a stamped and addressed envelope with your question, and it will be answered promptly.

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the current down to a low voltage. If D. C. is to be used, it would require a motor-generator set to change from A. C. to D. C. Even tho you buy the current from an interurban electric railway where D. C. is used, you will be able to purchase A. C. because the newer stations are generating A. C. and transforming to D. C. at substations situated along the right-of-way. This is being done because A. C. can be carried to a greater distance with a smaller loss than can D. C.

The D. C. motor is more expensive and more troublesome than A. C. particularly with reference to the commutator and brushes, which wear quickly and spark unless sealed from dust. The A. C. motor has a different construction.

The method of power application is another question that can only be determined "on the ground" whether you connect direct by use of flexible couplings or gearing, or by using chain, canvas or rubber belting depends entirely on local conditions and a decision can only be made "on the ground." Without knowing conditions, we suggest that you at least consider and study thoroly the propositions of individual motors for each machine or at least one motor for each interlocking group of machines. This method of power application permits of flexibility, each machine being independent; power is saved, a greater degree of efficiency can be obtained and this means an increased output.

For example, if the clay is wet or for some other reason it is found advisable to discontinue grinding, the balance of the plant can be operated without the necessity of turning over the main shaft and countershafts, which requires a considerable use of power to overcome the friction of belts and bearings. Any one machine can be operated or cut out independent of all other units, and with the consequent saving of power.

Correcting Reply to No. 718—Iowa

In the Nov. 16 issue, a question was published under the above number, and an answer given in which it was suggested that the reader who sent the question take the matter up with "his state university"—meaning the State University of Iowa. Homer F. Staley, ceramic engineer, attached to the Iowa State College, at Ames, Iowa, writes under date of December 10, as follows:

> In regard to the advice you give in your issue of November 16, in the "Questions and Answers" department, and to No. 718, Iowa, concerning glazing surface clay bodies, would say that the advice seems to be very good, except that you send your correspondent to the wrong place. The state University of Iowa is located at Iowa City, and does no work in ceramic engineering; in fact, it does not have the equipment to do this kind of work. The educational and scientific work in ceramic engineering conducted by the state of Iowa is done in Iowa State College,

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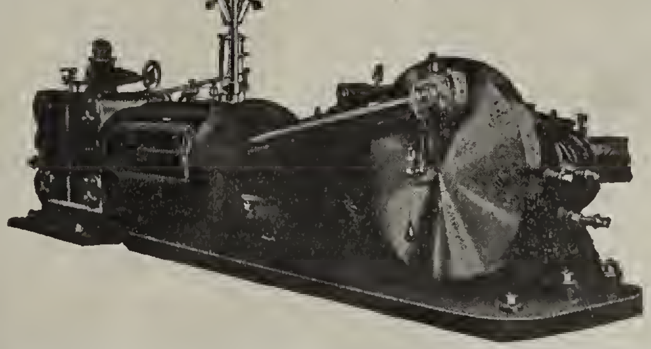

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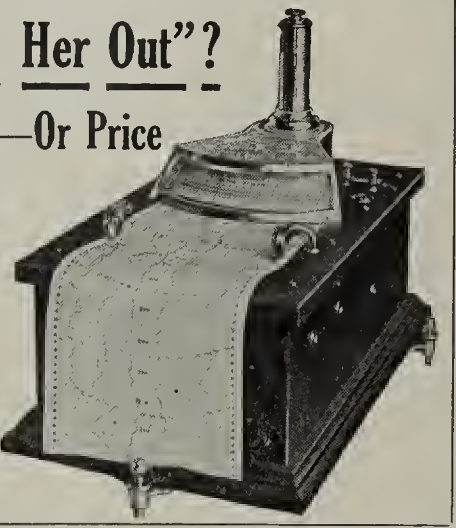

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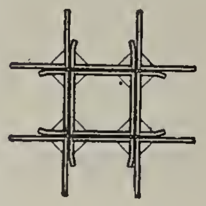

Send for This Booklet
Contains lots of good information for the man who wants to reduce his power and light cost, as well as the gas engine operator who is interested in getting the most efficient results from his equipment.
CONTENTS
Advantages of gas power.
Facts and Figures.
Bruce-Macbeth Engineering Service.
Producer Gas Plants.
How thousands of wasted horse power can be saved.
Meriam Steam Process.
Gas Engine Data.
(A section for the operating engineer.)
The Bruce-Macbeth Engine Co
2134 Center St. N. W.
CLEVELAND

located at Ames, Iowa. At this college we give a complete course in ceramic engineering, and keep two men busy in the Engineering Experiment Station, doing ceramic research work. Our laboratories for testing clay are among the most complete in the country. Assuring you that we would be pleased to be of service to "718—Iowa" or any other of your subscribers in our state, we are

We might say that clayworkers operating in states that are not so fortunate as Iowa, and which have no ceramic department connected with any of their state institutions, will receive every consideration at the hands of those in charge of such work as is described by Prof. Staley. The clay testing and research departments at Urbana, Columbus, Alfred, New Brunswick, Ames and elsewhere are not alone maintained for the residents of the states which support them, but for the entire country.

Shale for Acid Rings

732. *Georgia—I am desirous of obtaining the specifications of a shale that would be found suitable for use in the manufacture of acid rings, acid tile and floor tile. I shall be glad if you will advise me what kind of a shale will make this product.*

Any shale that is low in lime and not above the average in iron content, which will work well and vitrify to a good, dense non-absorbent body, can be used for acid rings, acid tile and floor tile. For chemical stoneware, acid-proof brick, tile, rings, etc., a No. 2 fire-clay or stoneware clay is more often employed than a shale, for the reason that these have a longer vitrification range and do not so often develop a viscular structure, coincident with vitrification. Sometimes five to ten per cent of feldspar is added to such a clay for the purpose of lengthening its vitrification range and increasing its density.

Havard's "Refractories and Furnaces" has considerable information on this subject—pages 185 to 187.

It may be possible, but not probable, that any specifications could be given you that would be of service.

Chemical Analyses of Fire Clay

733. *Louisiana—I wish to get your opinion of a certain clay which I wish to use for the manufacture of fire-brick. The analysis of this clay is as follows:*

H_2O	3.14
CO_2	7.20
SiO_2	58.05
Fe_2O_3	1.05
Al_2O_3	27.79
CaO	2.00
MgO	.25

I understand that grog and flint clay are used with some fire clays in the manufacture of fire brick. Is grog used for any other purpose besides to reduce the shrinkage in brick? Does flint clay have any other effect than to raise the fusing point of the clay? I have read in Seger's books where sand is used to raise the fusing point of clay. Sand is much cheaper for me to obtain than flint clay. Would the former serve the purpose as well as the latter? The only use that I would intend to sell these bricks for would be to line fire places and boiler furnaces. Judging from the above analysis, about what do you consider the fusing point of this clay? Do you think the fusing point would be high enough for the purpose I have mentioned without the addition of sand or flint clay? Is there anything that can be used to make a brick stand a variation of temperature? I have seen brick made of this clay by the stiff mud process. They were very hard and dense and were used in the construction of a sewer system on account of their low water *absorbtion. This clay has been used in the manufacture of stoneware and the products made from it were very good.*

I have been searching for a book which treats of the manufacture of fire brick, but I have been unable to find one. If you know of any book which treats of this subject I would be glad if you would tell me where I could obtain the same.

"Brick and Clay Record" would rather not go on record as giving an opinion on the qualities of the fire-clay, if the opinion is to be based upon a chemical analysis.

Regarding the use of grog and flint clay and the many other questions that you ask, we recommend the purchasing of a copy of Havard's "Refractories and Furnaces" which you will find listed in "Brick and Clay Record's" book department.

Having read this, we would suggest that you send a generous sample of your clay to some state university, with the request that tests be made upon it, including in your letter of inquiry to whatever university you write, the facts that you have detailed in the letter which we have printed as your question. With this knowledge of what you want to find out, any university with a good testing department will be able to give you a report which will be worth a great deal more to you than any "opinion" which we might give.

Wants Cost Ledger for Brick Plant

734. *Indiana—Can you give me the address of some firm where I can get a brick ledger with different forms to keep records of kilns burned, bricks made, bricks shipped and in fact a book where a man can keep an exact record of business done on the year.*

We do not know of any concern that has made a specialty of ledgers of this character altho practically every large face-brick manufacturing establishment has books of this kind. We are under the impression, however, that in every instance these ledgers have been made to order for the various concerns who use them and we do not know that there is any way of recommending one as being any better than another.

If any of our subscribers have a complete ledger form such as is required by the above correspondent, we will be very glad to receive sample sheets and it may be that if a sufficient number of these are sent us, an article can be prepared which will be of great interest and value to our readers.

An Important Correction

728. *Ontario—I have had a great deal of trouble from colored tile this summer. My clay is mostly white, but the tile come out nearly all red. Break a chip off and inside it is burned white, but the outside color is a red. I burn coal mostly and a little wood at times. Would wet coal produce this color? My first kilns and my last two kilns are white and we had no rain while burning them, but we had wet weather for most of the others. What produces this stain? Would it burn off if the heat were raised higher?*

The above question was published and answered in the Dec. 7, 1915, issue of "Brick and Clay Record." Some time after that we received the following letter from Charles F. Binns, Director of the New York State School of Clayworking and Ceramics at Alfred, N. Y.: "I venture to criticise your answers to question No. 728. The red stain on white clay is strictly analogus to white stain on red clay. The clay evidently contains sulphate of iron; this is brought to the surface on drying. The weather conditions mentioned confirm this diagnosis. The stain will only grow darker at higher temperatures; the remedy is to use enough barium carbonate in the clay body to fix the sulphate. The quantity to use can easily be determined by experiment, probably one-half of one per cent will be sufficient."

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Do you carry a stock?—ready for a new shaft, a worn crusher bearing, a hot box—on engine, shaft or machine.

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in coils or looped lengths

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in coils or looped lengths

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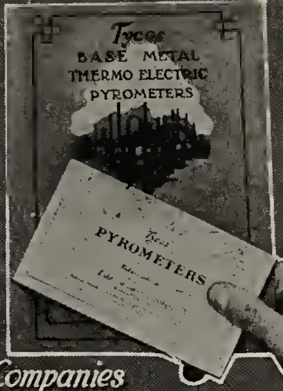

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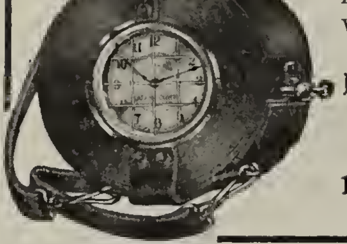

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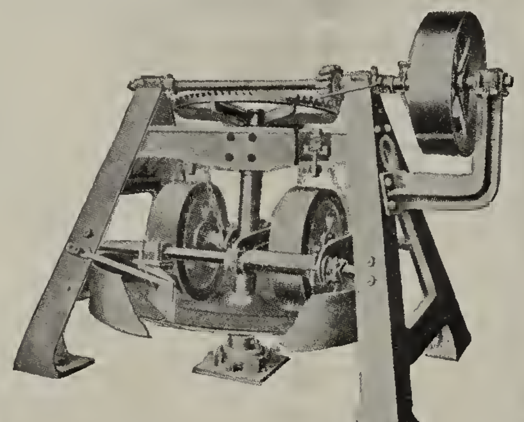
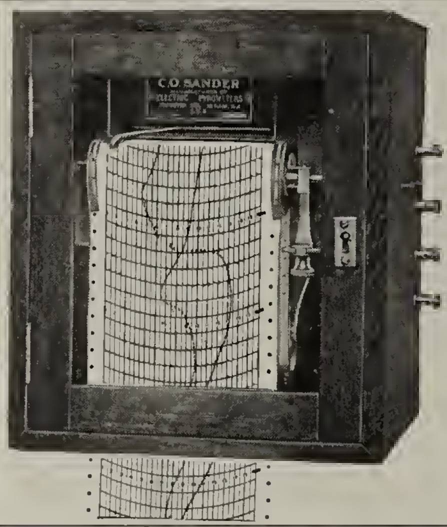


THE EAGLE DRY PAN

Write for Prices

EAGLE IRON WORKS DES MOINES, IOWA



Guessing Is Poor Business

You don't guess at the time of day. You look at your watch and KNOW. Why guess at temperatures? It is infinitely harder to do it correctly, almost impossible. The money lost as the result of one guess would pay for a Sander. Ask

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The Beam swings and drops,
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Swings back—then dumps—
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WOODHOUSE CHAIN WORKS Trenton, N. J.

The Letter Box

A Place Wherein Letters That Have General Interest Are Published and Commented Upon

Brick Walls With Air Spaces

The following letter, written by B. H. Richards, Jr., secretary of the Richards Brick Company, of Edwardsville, Ill., raises an interesting question. It is dated December 20, and reads:

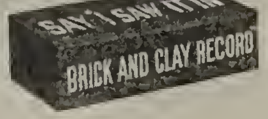
> We are interested in hollow wall construction—not hollow tile walls, but walls of brick, built with an air space. This interest, just now, results from the fact that the exceedingly heavy rains of the past season and especially one 36-hour driving rain in particular, penetrated thru a great many heavy, solid brick walls, and in several instances in this town, the water soaked thru thirteen-inch walls of solid brick, causing large wet spots here and there.
>
> The writer understands that, in a good many instances, houses that were backed up with hollow clay tile were also made damp inside, as the water, having made its way thru the face-brick veneer, worked back to the inside of the wall —probably thru the mortar joint.
>
> Now as we are not equipped to manufacture hollow tile, we are trying to find a way to overcome the objection to a solid brick wall, and we have recommended, in recent cases, the use of a ten-inch wall (two courses of brick, with a two-inch air space intervening).
>
> We use a hard-burned, semi-vitrified, flashed pressed brick for the outside wall and a light common-brick for the inside, tying the two together with a plentiful quantity of galvanized wall ties.
>
> Some of the mason contractors claim that the work goes considerably slower on this kind of work than it goes when solid walls are being laid, for the reason that it is necessary to carry a line on the inside of the wall as well as on the face. They are therefore compelled to figure a little higher for labor than in the case of a solid nine-inch wall.
>
> However, the writer believes that in this type of construction, where there is absolutely no break in the air-space from the bottom of the wall to the top, and the only connection between the face-brick and the backing is that given by the wall ties, we have the really ideal condition of insulation against heat, cold and dampness.

"Brick and Clay Record" will be very glad to receive any suggestions from its readers on the above subject. Has experience taught that a hollow wall, such as Mr. Richards describes, is a better wall (for the purposes noted) than one constructed of hollow building block?

Who Made the First Rough-Faced Brick?

A letter which comes from I. G. Poston, president of the Poston Brick Company of Springfield, Ill., contains a statement or two which, while not intentionally misleading, may put some people on the wrong track. Having "registered" this fact, we publish the letter, which bears the date of January 3:

> In your Dec. 21st issue of "Brick & Clay Record" we noticed an article headed "Rough Faced Face Brick—a Menace," written by T. P. Cuthbert, General Manager of Fallston Fire Clay Co., Pittsburgh, Pa. We wish to offer some information which may prove of interest to your readers.
>
> Mr. Cuthbert, attempting to show the advantage of smooth over rough texture brick, wishes to be enlightened upon the question, "Who started the fashion?", or in other words, who made the first rough faced building brick, which he calls a menace to the growth of brick architecture. He is very positive that the first rough textures were made six or eight years ago which certainly must throw the discredit upon our shoulders, as we have been making Poston Oriental rough faced builders,



and shipping same to all parts of the United States, for a period of over thirteen years.

In 1903, we furnished our rough faced builders for R. E. Sweeney, of Indianapolis, and soon, thereafter, we shipped the same rough textures for John R. McLean's residence in Washington, D. C. We were further encouraged in making this style of brick when the late Stanford B. White, noted architect of New York, recognized the artistic possibilities by use of rough texture and strongly endorsed them by specifying same in several large buildings in New York City. Thus, the demand was created and grew in such proportions that we are now in the process of constructing a modern plant at Springfield, Illinois, where we shall continue to manufacture Oriental Brick, under the name of "Pos-Tex," along with our Poston Pavers.

We not wish to use any more space in your valuable magazine, at this writing, except to say that if it is true that we have "Created a condition destined to ruin the brick industry" we are pleased to carry the responsibility. We are most profound believers in brick. We contend that a brick is a brick, so long as it is of good quality, be it of rough or smooth texture, and we also believe most earnestly in co-operation and in boosting the brick industry twenty-four hours each day of the year.

One discrepancy in the statements above made is in connection with the McLean residence in Washington, D. C. It will be noted that Mr. Poston locates the date upon which he furnished brick to this building as "soon after" 1903. The fact of the case is that the brick were shipped in April, 1907, and came from Crawfordsville, Ind. The only rough textured brick which the late Stanford B. White ever specified (this according to the best authorities in New York) was a semi-glazed, crackled surface, almost white brick, of the exaggerated "Norman" size (approximately 12½ x 3 x 4 inches) manufactured by Sayre & Fisher at Sayreville, N. J.

It is hard to see how Mr. Poston received any "encouragement" from these specifications as the "Oriental" brick which was at that time from Crawfordsville measured 9 x 2 x 3½ inches, being a split paving block.

The first building of Oriental brick to be put up in Chicago was one located on Lake Park Avenue between 47th and 48th Streets, the brick for this being supplied by the Crawfordsville plant in September, 1905.

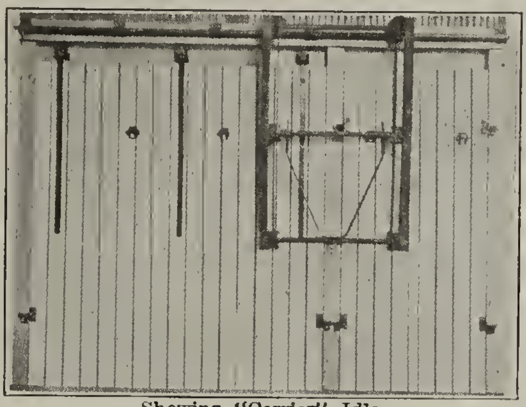
The credit or "discredit" as Mr. Poston puts it, of introducing rough textured brick, is claimed by many plants and "Brick and Clay Record" would be very glad to receive letters on this subject. It has been claimed, for instance, that the rough textured brick shipped from Ridgway, Pa., for a club house in Buffalo, N. Y., antedated all other shipments of brick that were approximately close to the present "textured" brick.

And maybe far ahead of all that, and so closing the incident—is the fact that the famous "raindrop" brick made on or near the Raritan River in New Jersey, was distinctly a rough surfaced brick, although its texture was given it by a natural process rather than with a wire. If this brick can be classed as a rough face-brick, then it is, beyond doubt the leader of the fashion. Some of these "raindrops" had been used in public buildings in Chicago which had seen considerable weather before the World's Fair opened in 1893.

Are You Reading "Buying Well?"

The "stories" on page 157 are the fourth lot that has been published. Go back and read them all. Then write us a letter telling something about your experience.

Keep the Heat in Your Drier



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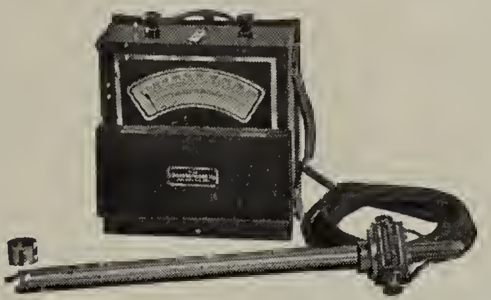

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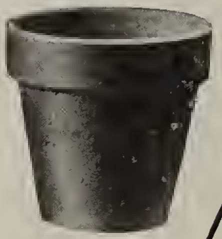

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Place the machine off in one corner of your plant, and let it absorb the spare time of your machine room men. They soon become expert, and a stock of flower pots quickly collects, ready for the kiln.

It is almost pure velvet—a bi-product—a sure seller with a manufacturing cost low enough to insure a goodly profit.

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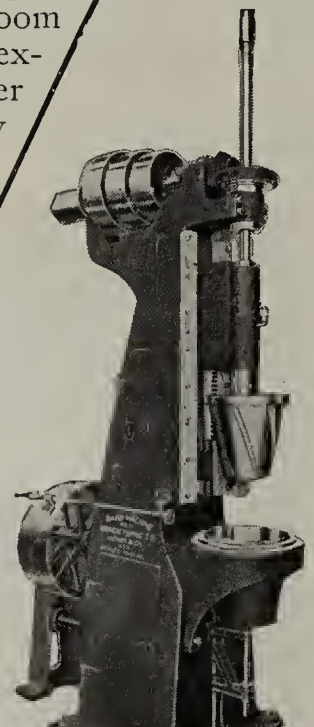

The Semi-Monthly Trade Review

THE DEEP TONED RINGING of the bells which proclaimed the advent of a new year had hardly died in the distance when, with renewed vigor, the weaver hastened back to his loom, the clerk to the counting house, the workman to his bench and the mason to his trowel, to start with a rush the new lap in the race for national industrial supremacy. January opened, following a holiday season that was remarkable for its brevity. The usual shut-downs for repairs, recesses and inventory-takings were cut down to the shortest possible period in all industries in order to resume work on orders that are piling up at an unprecedented rate. Clay plants were no exception in this curtailment of "loafs," reports from all sides indicating that little time was taken to "celebrate." Where repairs were made, these were carried on with a celerity that stands in marked contrast to similar processes of past years.

Building, favored by open weather in many localities up to the middle of January, has taken on increased activity, creating a good demand for common and face-brick, hollow-tile, load-bearing and fireproofing, roofing-tile, decorative-tile and terra-cotta. Brief reports, giving a few details of building conditions as they exist in the leading cities of the country, read in somewhat the following manner:

Chicago—Building operations again were favored by open weather, the activity continuing to draw heavily on both men and materials. Permits for the week ending January 8 were $979,200 in value as compared with $739,700 for the same week a year ago. Business structures authorized during 1915 totaled $22,158,575 in value, which is contrasted with $16,467,642 in 1914.

Pittsburgh—Architects are figuring considerable work for spring.

Philadelphia—Activity continues in building construction, the material men being more than satisfied with conditions. Permits now being taken out for new operations show a large gain over last year at this time and all indications point to a protracted period of prosperity.

Baltimore—Building operations for the month of December were of good volume, the office building inspector having granted permits valued at $1,305,120.

Boston—Here is an exception to the rule. Unlike most localities, unfavorable weather has stopped the building activity at the "Hub of the Universe."

St. Louis—The estimated value of building permits for December was $637,977, as against $416,000 for the same month last year.

Cincinnati—A substantial increase in permits granted for construction work was shown for December, the aggregate cost being largely in excess of the same month in 1914.

Toledo—Building permits for 1915 showed an increase of over $1,500,000 compared with 1914.

Minneapolis—Building and contracting are very active. The building permits for the past year were more than a million dollars in excess of the previous twelve months. Many new factories and business properties are in the course of construction.

All of the above showings have been made in the face of the fact that December is, and always has been, considered the poorest building month in the year, with January a close second.

From these facts, it is easy to see why plant owners are anxious to work every day possible and why holiday cheer was confined to a few days instead of a few weeks.

ORDERS TO FLOOD DRAIN TILE PLANTS

With regard to the demand for drain-tile, little can be said, as this is the period when plants are working to put up stocks for the coming spring. However, a letter, sent out by the secretary of the Iowa Clay Products Manufacturers' Association to its members recently, contains a few paragraphs that are significant of trade conditions.

"It is very much more than likely," the epistle states, "that by the time this letter reaches you the demand for drain-tile will show a very healthy tendency to grow. Within six weeks every factory will be flooded with orders and a condition will prevail, which, in most industries means a stiffening of prices."

FIRE BRICK SALES ARE HEAVY

Unusual activity in the iron and steel trades has had a startling effect upon the demand for fire-brick. The production of pig iron in December touched a new high spot, totaling 3,203,322 tons, compared to 3,125,491 tons in October, the previous high record in the history of the country. There were fully twice as many furnaces in blast on January 1 as on the same date of 1915, and the pressure of work is so great in that industry that extensive additions to productive capacity are now being made, or contemplated. It is stated that plans for no less than ninety new furnaces are being made, work on many of which has already started. It is needless to say that the demand for shapes has jumped to new high levels and promises a continued flight for some time to come.

HOLLOW TILE PRICES ADVANCE IN GOTHAM

The first advance in hollow-tile, both load-bearing and fireproofing, in a year on the New York market was recorded late in December.

"One reason for the change in hollow-tile prices," said H. G. Thomas, salesmanager of the National Fire Proofing Company at New York, "is that there is an abnormal demand prevailing for this time of the year. The labor situation in all industries depending upon the Middlesex clay belt in the vicinity of our factory at Perth Amboy, N. J., is extremely acute, and there are instances known where advances have to be made in order to counteract the lure of larger pay from war munition mills."

"Another peculiar condition is the tremendous amount of cheap factory construction now going up in all parts of the country. These factories are taking care of war contracts. They realize, or rather expect, that after the war there will be little need for those buildings. They will not build permanently, yet they must build against conflagration. The result is that we have been having an

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We propose a plan by which you advance the cost of WALTON INSTRUCTION to subordinates upon whom you lean, allowing them to repay you a little out of each salary check; then rewarding their diligence in pursuing their studies by refunding to them when they **complete** the course and get the Walton Diploma, all or part of the money they paid you.

This will enable you to prove which of your men have the real stuff in them.

You will marvel at the way in which this training, almost from the start, will broaden a man's horizon, and increase his powers of analysis.

As an Employer or General Executive, you know how much you must depend upon the sure-footedness of your accounting department in making the right **interpretation** of every transaction.

Our instruction is vastly different from that furnished by the "bookselling" correspondence schools.

Seymour Walton, B.A., C.P.A., Dean of the Walton School, was successively Professor of Accountancy in Marquette University and Northwestern University.

The Walton courses have been adopted and are being taught in the Schools of Commerce of leading universities, such as Columbia, St. Louis, Des Moines, Southwestern, Tulane, Montana.

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These locomotives are reliable, because they are correctly designed and built. They are economical, because they consume no fuel while standing idle.

Record No. 74, which is yours for the asking, tells all about them.

THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA, PA., U. S. A.

Burns Paving Block in 5½ Days

The McManigal superheating system collects all the radiated heat from the kiln crown, and feeds it into the furnaces at 700° F. It is accomplishing a saving of 50% in fuel and at least two days in time. Put it on one of your kilns—now.

The McManigal Grateless
Furnace Company
LOGAN, OHIO

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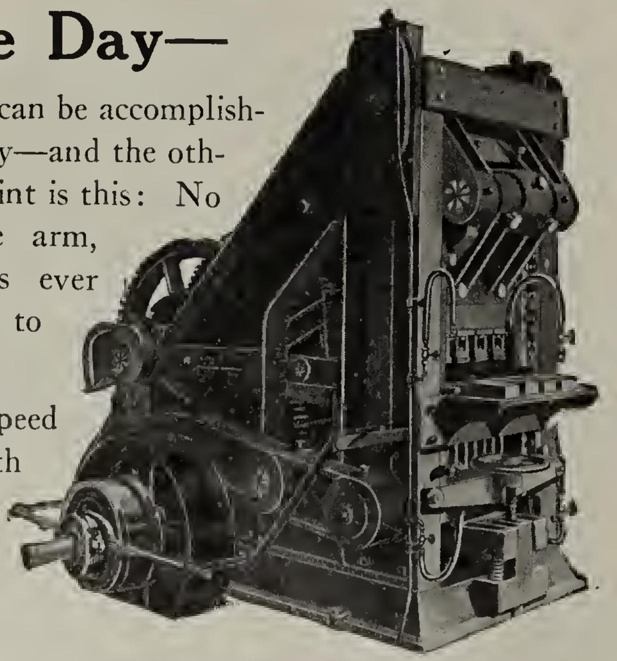
DRY PRESS BRICK

In One Day—

That record can be accomplished consistently—and the other wonder point is this: No gear, pressure arm, or frame has ever been known to break.

It has high speed combined with great strength and efficiency.

The extra brick that can be made in one day, over your present system can be made with practically the same power and labor. The extra is your velvet.



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Illinois Supply & Construction Co.
Century Bldg. St. Louis, Mo.

abnormal demand for cheap "seconds." This has brought the finer products into greater firmness in the open market, and it has been necessary for us to hold to firmer prices for it.

"At the same time, the demand for the best grades of tile has not diminished, as is customary at this time of the year. We have a big inquiry and large orders on hand. The improvement in demand for all grades of hollow-tile today is well in excess of ten per cent greater than it is in normal winter months."

Common-brick on the New York market has reached the price of $8.50 a thousand, which is believed in some quarters to be the limit. However, the fact that even higher prices may be quoted before spring is indicated in the action of those New York dealers who are "riding" from stock and who are not open market buyers.

From the above outline of existing conditions, it is very plain that there is hardly a branch of the clayworking industry that has not shared in some measure in the prosperity that has spread over this nation like a gigantic smile. However, there is just one cloud on the horizon that has any chance of developing into a trouble maker. That is over-production or inflation.

OVER-PRODUCTION A MENACE

In a statement issued recently by Elbert H. Gary, chairman of the board of directors of the United States Steel Corporation, he summed up in detail the prevailing prosperous conditions in the iron and steel trade, and gave a forecast of the future. Because what Mr. Gary said applies, not only to his own business, but to trade in general, a portion of his statement is quoted here.

"It will be admitted by all manufacturers," the statement says, "that there is no reason for complaint at the present time as to the volume or urgency of the demand, nor, in most cases, the prices received, notwithstanding the cost of production has been higher during the last five years because of increase in wages, freight rates, and so forth."

Mr. Gary then goes on to tell of the high rate of production in pig iron, calling attention to the fact that prices have not reached a maximum figure as yet. Early peace in Europe is predicted with a curtailment in the buying power of foreign countries. Following this he issues a warning:

"We must be prepared for radical changes in volume, in prices and resources. There is danger of over-production, over-extension of credits and liabilities, and over-confidence. We have observed this before and shall see it again. It is possible that the banks will over-extend their credits, particularly in favor of foreign interests who offer attractive rates, but they will take care of that matter for themselves.

"We business men should realize there is possible danger ahead in the business outlook, and if we proceed with caution, however, aggressively, we will have done no harm, and we may, hereafter, have reason for congratulation. We have the greatest country with the greatest opportunities, and may properly be hopeful and confident."

All of which applies to brickmaking. Over-production is always a menace in boom times and with the lessons of yesterday still in mind, we should carefully regulate the output to fit the demand.

Washington (D. C.) manufacturers report that the demand for brick is good considering the season of the year. Orders for the brick to be used in a number of apartment buildings have already been received.

In the Wake of the News

Being Brief Mention of a Host
of Interesting Happenings in the
Varied Fields of Clayworking

PERSONAL

James C. Adams, general manager of the United Fuel and Supply Company, of Detroit, Mich., succumbed to an attack of pneumonia, at his home in Pittsburgh, Sunday, January 9. The deceased was, for a number of years, manager for the D. J. Kennedy Company, of Pittsburgh, but had made his home in Detroit, since 1913.

Frederick B. Stevens, a Detroit (Mich.) dealer in firebrick and building supplies, addressed the Detroit Credit Men's Association on January 18, speaking on the subject of "Extending Credit and Getting the Money."

Mrs. Alice Taylor, wife of Herbert E. Taylor, owner of the Kankakee (Ill.) Brick and Tile Company, died at her home in that city on January 16, after an illness extending over a month.

A. P. McDonald, salesmanager for the P. Bannon Pipe Company, Louisville, Ky., recently returned from a short trip to Nashville, Tenn.

John W. Goulding, president of the Trent Brick Company, died recently at his home in Trenton, N. J., following an illness of more than a year.

R. W. Besley of the Hydraulic-Press Brick Company, Omaha, Neb., was recently elected a director of the Omaha Manufacturers' Association.

John Hooper, Sr., a prominent brickmaker of Pittsburgh, Pa., died on January 2 in that city at the age of seventy-six years.

Joseph Spang, a well-known brick manufacturer of Pottstown, Pa., recently celebrated his fiftieth wedding anniversary.

INDIANA

The Ayer-McCarel-Reagan Clay Company, of Brazil, Ind., is about to increase its battery of kilns by two new kilns, thirty feet in diameter, and expects to add two others within a short time.

Martin Brothers, brickmakers at Dunkirk, Ind., report business as being good. A drier and some new kilns have been erected at the plant, which expects to resume operations about March 1, turning out drain-tile, hollow-tile and brick.

IOWA

The Shellsburg (Ia.) Brick and Tile Works has been purchased by A. J. Budd from the Florida-Indian River Land Company. The plant includes sheds, kilns, machinery and seven acres of land which adjoins a twenty-acre tract owned by Mr. Budd. Charles Mullinex, who has been superintendent of the plant for the past two years, will continue in this capacity.

"Bolt It to the Bin"

The Columbus Feeder

for automatically feeding

Crushed Clay to Dry Pans *and* Pulverized Clay to Pug Mills

is fast coming into general use. There's a reason. Let us show you—furnish the machine on trial.

Send for Circular.

Ceramic Supply & Construction Co.
Columbus, Ohio

You won't have to worry about competition if you treat your clay with

R. H. Precipitated Carbonate of Barytes

You can safely guarantee that your brick will be

Scum-Proof

You can get a higher price and influence architects to specify your product because Efflorescence is prevented absolutely.

But insist on the R. H. BRAND—it's dependable.

We have a complete line of high grade chemicals for the clay industry.

The Roessler & Hasslacher Chemical Company
100 William Street New York
Chicago, Ill. Kansas City, Mo. East Liverpool, O. Philadelphia, Pa. New Orleans, La. St. Louis, Mo. Boston, Mass.

"To Make 1916 My Best Year"

Every time men make an honest resolve to do a good thing better, they *become* better.

Every effort to put business on a more fair and substantial basis not only makes business better, but it makes *better business.*

What better resolve can all of us make for 1916 than that we will each day see that *our* business is conducted so that we can look ourselves and all men squarely in the face;

That we will make competition respect and play fair with us, through first respecting and playing fair with competition; that we will aim to realize *fairly* on all work we do;

To realize, in short, that there is no room for a failure, and that all the world respects men who accomplish things honestly.

To that sort of declaration of principle we put our hand as one fitting every business and every enterprise, small or great. May it be your guide and ours—and may we all pull together to make 1916 the best year of them all, for us all!

The Marion Steam Shovel Company
Marion, Ohio

LEHIGH PORTLAND CEMENT CO.
LEHIGH
ALLENTOWN, PA.—CHICAGO, ILL.

Paving Contractors

who use Lehigh Cement for base, filler and grout on all brick paving work

Know Exactly What the Results Will Be

They know that a given proportion will give uniform results in every part of the work and that there need be no guessing as to strength, or uniformity or fineness. Prompt deliveries always.

LEHIGH CEMENT

Cement Grout for Permanence

KENTUCKY

Due probably to the unusually heavy demand now existing for fire-brick, B. A. Bounds of Annville, Ky., is reported as being interested in a proposition to establish a fire-brick plant at Bond, Ky.

The Paducah (Ky.) Clay Company has filed amended articles of incorporation increasing its capital stock from $4,000 to $12,000. The company has been opening up some new clay mines which have proven exceptionally good.

The West Point (Ky.) Brick and Lumber Company has opened its brickmaking plant which has been closed for several months. The plant is now employing a full force of men and has enough orders on hand to keep going for some time to come.

P. M. Crane of the East End Brick Company, Louisville, Ky., reports that the company has been receiving numerous inquiries for prices on brick, which indicates that building will be very active in the spring. A. M. Crane, a brother of Manager P. M. Crane, is now connected with the company.

For the past two years, the P. Bannon Pipe Company, Louisville, Ky., has been remodeling its sewer-pipe kilns. This work has now been completed, the burns in the new kilns surpassing all expectations in the glaze and quality of the ware produced. The company anticipates a heavy business in 1916.

The new year opened in Louisville, Ky., and vicinity with clay products manufacturers well satisfied with the business of the past year and looking with much expectation to a record year in 1916. Practically all of the local plants are operating at full capacity and most of them will continue to do so thruout the winter.

Open weather in Louisville is responsible for the large volume of small building operations that are now under way. With the exception of a few plants which are closed for repairs, most of the local brick manufacturing concerns are operating, taking advantage of the good demand that exists and the fact that cold weather has not interfered with work in the pits.

The Hillenbrand Brick Manufacturing Company's plant at Louisville, Ky., was closed from December 15 to January 15 in order to make necessary repairs to the equipment. On December 15 the company had a stock of about a million brick on hand, with which it was able to continue deliveries. Officers of the company report that they now have orders for the delivery of a million common and face-brick; besides prices have been quoted on a number of inquiries.

Both plants of the Louisville (Ky.) Fire Brick Company are now operating to capacity, inquiries as well as orders being received in large volume. The company has three steel mill orders on hand which call for approximately one million fire-brick. In addition to this business, from ten to fifteen cars are being shipped daily to navy yards for use in furnaces in plants and on steam ships.

MASSACHUSETTS

The Rinaldi Tile Company, Boston, Mass., has been incorporated with a captial stock of $6,000, by E. M. Baratta, president, Eugenio Baratta, treasurer and L. L. Rinaldi, a director.

Large brick orders continue to develop in Boston and thruout eastern Massachusetts owing to the heavy demand for new factory buildings in which to manufacture war munitions. Striving to equal this demand, however,

is the urgent need of materials for new homes and shops which are springing up everywhere in the New England manufacturing districts.

A large amount of terra-cotta is being used in the new Boston Elevated Railway Company's subway, the Dorchester tunnel of which is about completed. A white glazed material is being used, which gives a durable and easily cleaned wall surface.

Rough-textured face-brick are being used in large quantities in the new building area on Commonwealth Avenue, Allston, a suburb of Boston, Mass. Block after block of buildings, faced with red or buff brick, present a very artistic appearance. Near Warren Street in this same locality are three stores in which red rough-textured brick have been used. Near the new Market Bank building in Brighton, is another group of shops which have ornaments of dark green marble set in the brick facing. The design is excellent and is a credit to the builders.

MICHIGAN

Lynn Ferguson of the Ferguson and McCord Brick and Tile Company, Benton Harbor, Mich., returned recently from a trip thru Michigan, reporting that business is better than ever. He secured a number of large orders for brick and tile.

The steel work for the new Public Library building, at Detroit, Mich., in in place, and as soon as further appropriations are secured, the brick for this structure will be purchased. The building measures 198 by 219 feet, is three stories high, and will be one of the largest of its kind in the Middle West. Brick will be used for the outer walls and thruout the interior for partitions.

Contrary to expectations, the value of building operations in Detroit during 1915 was greater than that for the previous year. The total for 1915 was $32,000,000, a slight gain over 1914. The first six months in the year just passed were considerably below normal, but there was a marked improvement during the last six months. Operations have been steady and there seems to be no let up, due to the favorable weather which has prevailed up to the present time. There is some talk regarding an advance in the price of common-brick in Detroit, a number of the dealers being of the impression that the rise will take place in February. So far, however, nothing definite in this direction has been announced by the local brick manufacturers, altho several have intimated that such a plan is under consideration.

MINNESOTA

R. B. Hinkly, formerly owner of the Luverne (Minn.) Brick and Tile Company, which he sold to other interests about two years ago, reports that he has again come into possession of the property. Because of an increased demand for brick in that territory, Mr. Hinkly intends to resume operations at the plant, probably specializing on face-brick.

NEW YORK

The Nyatco Corporation, Manhattan boro., New York, N. Y., has been incorporated to manufacture clay products and other building materials. The capital stock of the new concern is placed at $50,000, the incorporators being: W. H. Garis, 146 Bleecker Street, Jersey City, N. J.; W. R. Waite, 214 Sixth Avenue, New York, N. Y., and H. L. Schoonover, 1025 East Thirteenth Street, Brooklyn, N. Y.

A very attractive catalog has been issued by The H. W. Covert Company, 351 Lexington Ave., New York, which has recently started a new department for the sale

But—You Can't Do It!

You can't get the kilns unloaded on time—You can't prevent accumulated demurrage on cars—You can't have satisfied hustling wheelers—

UNLESS

You have a fleet of INVINCIBLES

Look!

IT IS BALANCED

The axle is under the load—NOT at one end of it. It slides—down the runway—and the hind legs don't rip and tear.

It Rides Its Load

THE TORONTO FOUNDRY AND MACHINE CO.
TORONTO, OHIO

Heraeus LeChatelier Pyrometers

"The Ultimate Pyrometer"

Are designed and constructed to give lasting and uninterrupted service. Their higher first cost is many times offset by their lower maintenance cost.

180 Kilns have been equipped with Heraeus Pyrometers in the past year. Let us refer you to some who have them.

Send for New Catalogue

Charles Engelhard
30 Church Street
NEW YORK, N. Y.

BUFFALO
450 Rooms 450 Baths
Rates from $1.50 a day

DETROIT
800 Rooms 800 Baths
Rates from $1.50 a day
200 room addition building

CLEVELAND
700 Rooms 700 Baths
Rates from $2.00 a day
300 room addition building

At Cleveland in February

THE National Brick Manufacturing Association meets at Cleveland, Feb. 20-26. Hotel Statler is headquarters. *Reserve your room now.*

Early reservations are wise, because they make it certain that you can have just what you want. Hotel Statler will gladly send rates and detailed information, if you are not familiar with the house.

All the conveniences and comforts which can be provided by a complete equipment and a complete service—"Statler Service."

Every room has private bath with automatic mixer and anti-scald device; thermostat, by which the guest may regulate temperature of room; running ice-water, and other unusual features that make for comfort. Morning paper delivered free to guest-rooms.

As nearly "absolutely fireproof" as any building can be.

Club breakfasts served in all restaurants. Union depot cars pass the door. Rates from $1.50 per day.

HOTELS STATLER
BUFFALO - CLEVELAND - DETROIT

Bristol's Recording Instruments
For Pressure, Temperature, Electricity, etc.
Awarded the Grand Prize
AT THE PANAMA - PACIFIC EXPOSITION

Bristol's Recording Thermometers and Pyrometers used extensively to Control Kiln Temperatures

Bristol's Recording Instruments are unique in their extreme simplicity of construction and are guaranteed for satisfactory service under severe working conditions.

Write for Catalog 1400

THE BRISTOL CO., Waterbury, Conn.
BRANCH OFFICES
BOSTON NEW YORK PITTSBURGH CHICAGO

of brick and tile fireplaces and mantels complete. The brick and tile department is under the direction of George J. Jervis, formerly chief of the designing department of Fiske and Company, Inc.

The Acme Builders' Supply Company, Inc., with offices in the Prudential Building, Buffalo, N. Y., has been organized by Charles L. Hayes, who during the past few years has been identified with the Buffalo Builders' Supply Company. The new concern has a capital of $50,000 and will do a general business in builders' supplies. In addition to Mr. Hayes, the directors are George L. Gastel, Jeremiah J. Hurley, Bartholome Oddo and T. Regis O'Brien.

OHIO

The Farr Brick Company of Cleveland, Ohio, has been granted a permit by the city to erect a kiln addition measuring ninety-six by one hundred feet.

The Toronto (Ohio) Fire Clay Company will furnish the face-brick for the new filtration and power plant at East Liverpool, Ohio.

A. H. Smith, of Cincinnati, Ohio, has completed arrangements for the removal to Huntington, W. Va., of the Sanitary Manufacturing Company which manufactures a line of sanitary ware at Hamilton, Ohio. Incident to the change in location, the company will be reorganized with a capital stock of $300,000.

County commissioners at Akron, Ohio, have instructed their engineer to prepare plats and estimates covering the paving of fifteen miles of road in Summit county. Brick will probably be used unless the estimates are too high, the experience of the county with brick having been very favorable to the further use of this material.

Plans for new school buildings already announced, nearly every one of which will use brick, indicate that this sort of work will be plentiful during the early part of the year at least. At Dayton, Ohio, the school board will issue bonds to the amount of $330,000 to provide funds for three school buildings. At Akron, bids are already in hand for two schools, one of which will cost at least $73,000, while the other will cost $62,000. At Tippecanoe City, Ohio, a new school will be built at a cost of $80,000, if bonds for that purpose are approved.

Further details of the consolidation of the Deckman-Duty Brick Company and the Wooster Shale Brick Company under the name of the Medal Paving Brick Company give advice that the officers and directors of the new company will be: Spencer M. Duty, President; Charles A. Deckman, Vice-President; Herbert C. Moatz, Treasurer, and W. R. Barnhart, Jr., Secretary. F. E. Schultz is the fifth member of the directorate. The Medal Paving Brick Company will operate its plants at Cleveland, Carrollton, Malvern and Wooster, Ohio, maintaining general offices at the Swetland Building, in Cleveland.

Estimates for two paving projects in Springfield, Ohio, are under consideration by the city authorities, figures having been submitted for both brick and asphalt, based on estimates of $3.05 per foot for brick, $1.66 per foot for block asphalt and $1.55 for sheet asphalt. The city will pay a part of the cost of this paving, which totals $20,626, if brick is used, while property owners and the Ohio Electric Company will pay the remainder.

Figures, recently completed by the Cincinnati (Ohio) Chamber of Commerce, showing the movement in and out of the city of various commodities during 1915, reflect the unusual activity that has prevailed in building operations. Receipts, totaling 7,919 cars of brick, were noted during the year, as compared with 6,572 cars in 1914. Since the majority of these cars contained face-brick, this increase takes on added significance so far as the extent of building operations is concerned. Shipments from the city were 5,732 cars, containing for the most part common and hollow-brick. This is contrasted with the shipment of 2,995 cars in 1914.

OREGON

The Denison Interlocking Tile Company, Portland, Ore., has been incorporated by John C. Stanton, J. B. Currie and William D. Bennett, the capital stock being placed at $5,000.

The Warrenton Clay Company, Portland, Ore., has been incorporated with a capital stock of $125,000 to engage in the manufacture of sewer-pipe and drain-tile. The incorporators are William Bailey, D. B. Stuart and R. L. Yoke.

Foreign fire-brick, brought as ballast on grain ships, has formerly been used to a considerable extent by the lumber mills of Oregon and Washington, which in the aggregate, are large consumers. For some time past, the amount of foreign brick arriving has been greatly curtailed, and the indications now are that the lumber manufacturers will soon have to buy domestic fire-brick.

PENNSYLVANIA

The Johnetta (Pa.) Brick and Coal Company has been incorporated with a capital stock of $5,000 by I. L. Currier of Pittsburgh and Charles Hemlick of Johnetta, Pa.

Building operations in Harrisburg, Pa., during the twelve month period ending December 15, represented a total expenditure of $1,428,950, or nearly $2,000,000 more than in 1914.

The new brick plant of Leiby and Landis, located at New Cumberland, Pa., has been put into operation. This plant is one of the most modern in the state and its owners look forward to a good business in 1916.

The Bradford, Binghamton and Youngsville plants of the Foster Brick Company were purchased recently for $45,000 by S. A. Mundy of Bradford, Pa., at a sale conducted by Trustee in Bankruptcy. Mr. Mundy stated that the Bradford plant would resume operations very shortly.

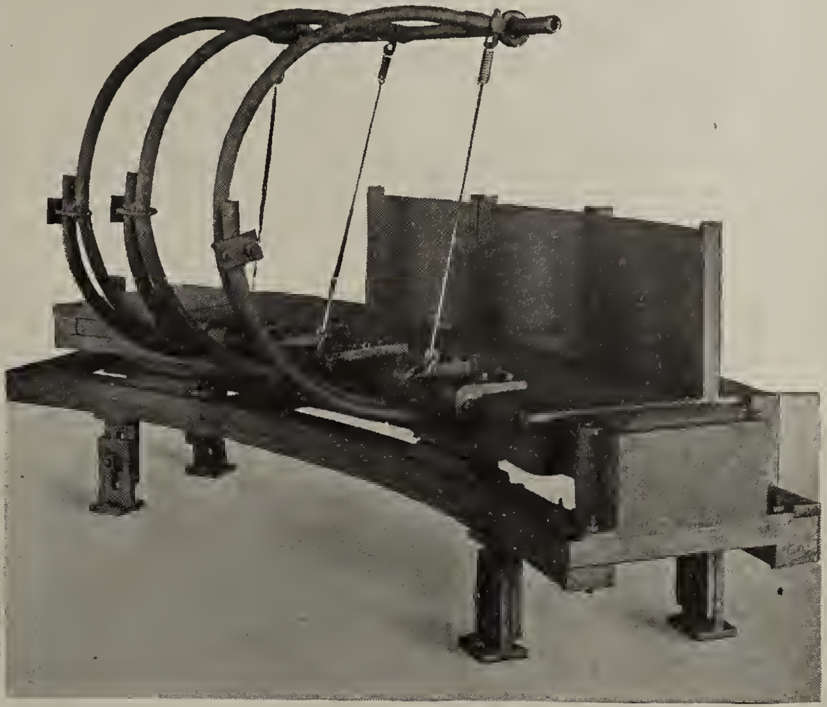
The Wyomissing Brick Company is a new Pennsylvania corporation organized to mine clay and to manufacture brick, hollow-tile and other clay products. The capital stock is placed at $10,000, the incorporators being F. H. Hansell, Philadelphia, Pa.; George H. B. Martin and S. C. Seymore of Camden, N. J.

The Harbison-Walker Refractories Company, Pittsburgh, Pa., is numbered among the fifty-six corporations and large employers of labor that have been declared exempt from the necessity for insuring for compensation liability, the state workmen's compensation board being satisfied as to the financial ability of these concerns to meet any claims which might arise.

"I can say that we have had a very fair and normal year," said Thomas E. Wilson, secretary of the Pittsburgh, (Pa.) Clay Products Company recently, referring to the business transacted by that company during 1915. "The prospects for 1916 are excellent. December brought many inquiries of a such a nature as to forecast a strong demand in the twelve months before us."

The United States Bureau of Standards, Pittsburgh, Pa., is conducting experiments with natural gas at its laboratories in an effort to solve the problem of cheaper porcelain firing for American manufacturers, and thus protect the industry

MANUFACTURERS OF SILO BLOCKS are interested in our NEW CUTTING TABLE—Cuts Silo Blocks Radially. The Price is $175.00.
All Iron Machine—no woodwork. One man operates it. Built like a machine tool.
Designed by engineers having had many years' successful manufacturing experience.
Built at Brazil, Indiana, the big clay center, where opportunity for advancement in clay product manufacture is constantly offered.



New "Daylight Shops"—A Modern Factory Layout Where the Best Work Is Produced Under the Best Conditions.
Get illustrated Bulletin G 25. Do this—ORDER IN TIME
Crawford & McCrimmon Co.
Established 47 Years Brazil, Indiana

Do you have Soft, Under-Burned Ware on bottom of Kiln?

The Improved Hook Patent Up and Down Draft Kiln eliminates this entirely and insures Good Hard Ware in all parts of kiln.

In further proof of our claim a letter from The Melvin Brick & Tile Co., Melvin, O., reads as follows:

OHIO KILN CO., Vigo, Ohio.
Gentlemen:—We are quite surprised at the results we have obtained since installing **The Improved Hook Patent Up and Down Draft Kilns.** We have been burning our **28 ft. kilns** on drain tile in from **55 to 60 hours,** where it formerly took 140 hours.
We use just about half the coal that we formerly used, and the tile are burned hard and uniform from bottom to top of kiln.
Very truly yours, Melvin Brick & Tile Co.
By W. F. Channel.

A saving of time and fuel of from 25 to 50%—ware burned uniformly from top to bottom of kiln, follow the INSTALLATION OF OUR SYSTEM. Mr. C. Hook is associated with our COMPANY, when you ask information or order plans you get his LATEST IMPROVEMENTS.

OHIO KILN COMPANY
VIGO, OHIO

PUT THEM IN THIS WINTER

The Canton Kiln Grate

From the time of the first installation in the kilns of the Massillon Stone and Fire Brick Co. of Massillon, O., up to the present time—dozens of sets have been installed—and are giving utmost satisfaction. Get a trial set, and prove with them that you can save over one-fourth of your fuel bill. Put them in just one kiln—their utility and the saving accomplished, convinces that the Canton is the only way.

The Canton Grate Co.
1706 Woodland Ave. CANTON, O.

REDUCE YOUR HANDLING COSTS
By the Purchase of Efficient Equipment

No. 217-E. Side Dump Car Equipped with Motor

ATLAS
High Efficiency
Cars and
Electric Locomotives

No. 126 Double Deck Dryer Car

will meet your requirements. Let us send you catalogue and quote prices.

Storage Battery Locomotive for general use.

THE ATLAS CAR & MFG. CO.
1287 Marquette Road, Cleveland, Ohio

in the United States against foreign competition. The fashioning of porcelains fully equal in quality to the foreign article, has been mastered, but the burning or hardening process is still too expensive for competition.

RHODE ISLAND

The plant of the Barrington (R. I.) Steam Brick Company was operated until January 1, this being much later than usual. The demand for brick in this territory, due to an open fall, resulted in the piling up of a large number of orders, the plant having just completed the last of these.

TENNESSEE

The Kingsport (Tenn.) Brick Company is making arrangements to increase the capacity of its plant. A building boom is now in progress at Kingsport, a number of new factory buildings, residences and schools being erected. Work on the new Kingsport Sewer Pipe Company's plant is being pushed.

TEXAS

The Sunset Brick and Tile Company, Gonzales, Tex., a newly organized concern, reports that it is now running full time and is ready for business. Owing to a confusion of names, the Emmet Brick and Tile Company of the same city has also been given out as a newly formed company which was ready to install new machinery at its plant. This statement is incorrect, the Sunset Company being the only brick concern located at that point and, as above noted, has bought all of its equipment.

WEST VIRGINIA

The Spencer (W. Va.) Brick Company recently secured the contract for the erection of a brick school building in that town.

Pottery Notes

A Resume of the Activities of the Potters and Some Mention of their Plans for the Future.

The buying of pottery "Made in U. S. A." at the present time is the heaviest that has ever been experienced, according to the salesmanagers of the various plants. Many potters are displaying their lines for an entire month at Pittsburgh, and a host of buyers are attending these exhibitions. It has been noticed that, during the past few months, American pottery manufacturers in a number of instances have started to manufacture art lines which were heretofore only to be had from importing houses. The contention has been, in the past, that duplicates of foreign art pottery could not be made in the United States, but the lines now on display at Pittsburgh show that this theory is far from being correct. Colors, glazes and the design of mold are, in many instances, superior to those of some of the imported lines.

Commissioner Lewis T. Bryant, of the New Jersey state labor department, has submitted his annual report to Governor Fielder. That part of the report which covers the potteries indicates that there is less danger from lead poisoning than ever before. The factors responsible for this, Mr. Bryant states, are greater personal cleanliness of the workers; the spread of intelligent information on the effects of lead poisoning; better sanitary inspection and in the establishment of a health committee comprised of manufacturing potters and representatives of the National Brotherhood of Operative

Potters. The report also describes the marked advancement in working conditions in the porcelain and flint industries.

Indications point to the fact that one of the large electric porcelain plants in the East Liverpool (Ohio) district, which is now idle, will be placed in operation before long. Several years ago all of the electric porcelain plants in that district were taken over by the General Electric Porcelain Company, the business later being consolidated and operations transferred to Parkersburg, W. Va., where a large new plant was built. Since that time, however, one of the electric porcelain plants near East Liverpool has started in again and is working full time. That other idle electric porcelain plants in this territory will soon be placed in operation, is a certainty.

Daniel McCarron, formerly general salesmanager for the central west territory of the Potters' Co-operative Company at East Liverpool, Ohio, has resigned his position with that firm to accept the general management of the Ohio China Company's plant at East Palestine, Ohio. Mr. McCarron succeeds C. L. Hart, who has been in charge of the East Palestine plant for the past year. It is possible that the Ohio China Company will place a new dinner shape on the market before long, as it is the intention of the new management to enter the dinnerware field heavily.

Much interest is being centered in the western pottery district over the report from New York of the formation of the United Potteries Company, which has a capital stock of $10,000. The parties interested in this company are B. F. Foster, A. Plase and W. Thomas, who give their office address as 145 West Eighteenth Street, New York, N. Y. The charter gives the company the right to engage in the manufacture of pottery and other ceramic lines; also to do construction work and enter into the real estate business.

Many members of the pottery industry were shocked recently, when informed of the death of Henry Brunt, general manager of the Edwin Bennett Pottery Company, Baltimore, Md. Mr. Brunt was a pioneer in America in the handling of high-grade pottery, and until moving to Baltimore, was connected with the Empire Pottery Company of Trenton, N. J.

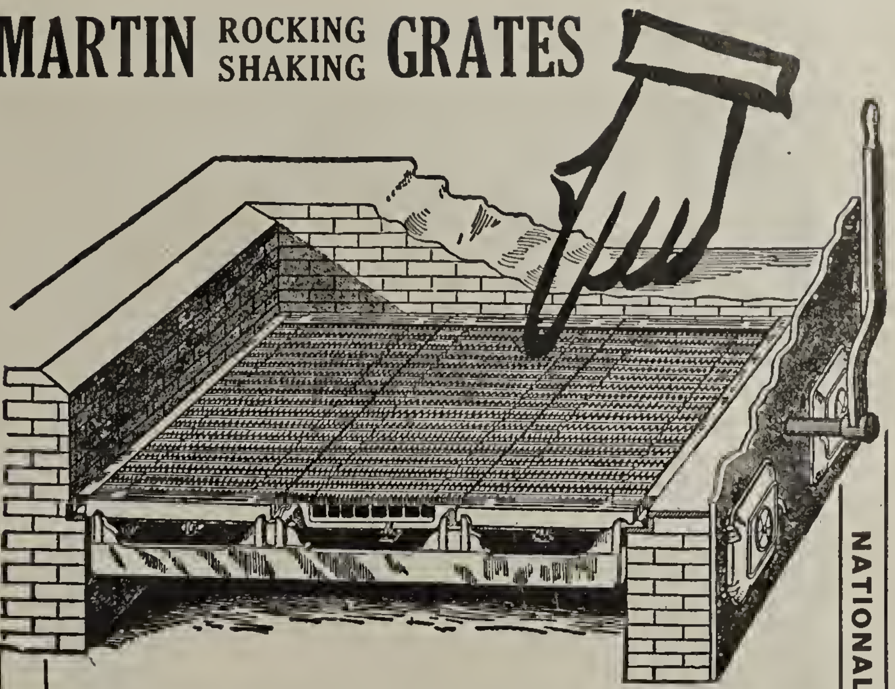
Col. William A. Rhodes, a well known pottery salesmanager, has been appointed general manager of the Colonial Pottery Company, East Liverpool, Ohio, leaving the position of salesmanager with the Carrollton (Ohio) Pottery Company. Col. Rhodes succeeds C. L. Gray who has left the Colonial Company to become associated with the Cartwright Brothers Pottery Company.

Records show that 1915 has been the most successful year in the history of the Warwick China Company, Wheeling, W. Va. This company's plant has worked to full capacity thruout the year, something that has never been done before. Its lines of vitrified china dinnerware have been largely increased, the output being sold for several months to come.

Charles C. Ashbaugh, president of the West End Pottery Company, has been elected president of the East Liverpool, Ohio, Chamber of Commerce. W. E. Wells of the Homer Laughlin Company, and H. N. Harker, of the Harker Pottery Company, are also officers of the organization.

The Tritt China Company, of Niles, Ohio, which has been considering various offers to move its plant, has finally decided, it is announced, to remain in Niles. An addition to the present plant will be started at once.

Thomas B. Anderson of Chester, Ohio, who has been identified with the Edwin M. Knowles China Company as secretary and general manager since its incorporation in 1900, has severed his official connection with the company.



MARTIN ROCKING SHAKING GRATES

Your Books Will Show the Savings

At the end of each month there is a record of a **smaller** amount of coal purchased and **used,** when you use

MARTIN GRATES

They have for years been used by the very finest and best managed plants in the clay industry, and have always shown big, decided fuel savings.

You can not afford to continue without them.

Write immediately for details and prices.

The MARTIN GRATE Co.
347 S. Dearborn Street
Chicago, Illinois

NATIONAL FIREPROOFING COMPANY
WABASH CLAY COMPANY
BACH BRICK COMPANY
LEHIGH SEWER PIPE & TILE COMPANY
NELSONVILLE BRICK COMPANY
BARR CLAY COMPANY
IRONCLAY BRICK COMPANY

BURNING

Of *course* it attracted your attention as nothing else in the clay working language *could* have done.

Your burning is costing more today with less satisfactory results than any other single operation.

Presumably, every piece of ware that is set in the kiln, is in perfect condition.

But——

The burning operation returns them, 70-75% firsts, 25-30% seconds, culls.

The answer is THE HOOK SYSTEM.

It is the *big* idea, up and down draft, perfect control, low fuel consumption. Withal, quick action producing a higher quantity and quality of FIRSTS.

HOOK PATENT KILN CO.
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Canadian Office:
250 Dufferin Street TORONTO, ONT.

Machinery and Equipment

Being Descriptions of Such Machinery and Accessories as Our Advertisers Have to Offer and Such Announcements as Are of Interest to Our Readers

A Dragline Cableway Excavator for Clay Plants

Excavation, the primary operation on a clay plant, is rife with possibilities for high or low cost digging. Just what to do, or just what not to do, consumes considerable thought: the correct conclusion means success or failure.

Excavation of clay, shale and overburden is attended with different difficulties; no one machine can cope with them all—economically.

In the field of surface clay, or in stripping overburden from shale beds, Sauerman Bros. claim that their Dragline Cableway Excavator is supreme.

It has a wide scope with one setting of the machine. It hauls (by cable and suspended bucket), the material from 500 feet away up to the plant itself or to the dumping platform, and it is all under the positive control of one operator. He directs from the hoisting engine the complete operation of the bucket while digging, dumping and returning to pit.

Another splendid use for the machine is in stripping the shale bed. The spoil is taken off and carried back—and dumped into the excavation made by the steam shovel or other excavator. The "hole" is filled up, valuable land is reclaimed, and it is all speedily accomplished without

Two Interesting Installations
of the
SAUERMAN
Dragline Cableway
EXCAVATOR

I. Building A Levee *From article appearing in the Contractor*
II. Handling Commercial Clay *From article appearing in Brick and Clay Record*

SAUERMAN BROS.
Engineers, Dealers, Manufacturers
MONADNOCK BUILDING CHICAGO, ILL.

The Bucket Dumping

the use of dozens of laborers, wagon and teams or locomotive and cars.

In digging clay from under water or in marshy land, it is perfectly adapted, and in this field alone it is bound to open up many abandoned clay beds for commercial use, but its big, wide field of usefulness is in digging the surface clays and stripping the shale beds of the troublesome, expensive overburden.

Have you your copy of the Sauerman descriptive folder? Send for it at once, to Sauerman Bros., 316 South Dearborn Street, Chicago, Ill., as you will find it of interest and value.

Federal Trucks Awarded Gold Medal

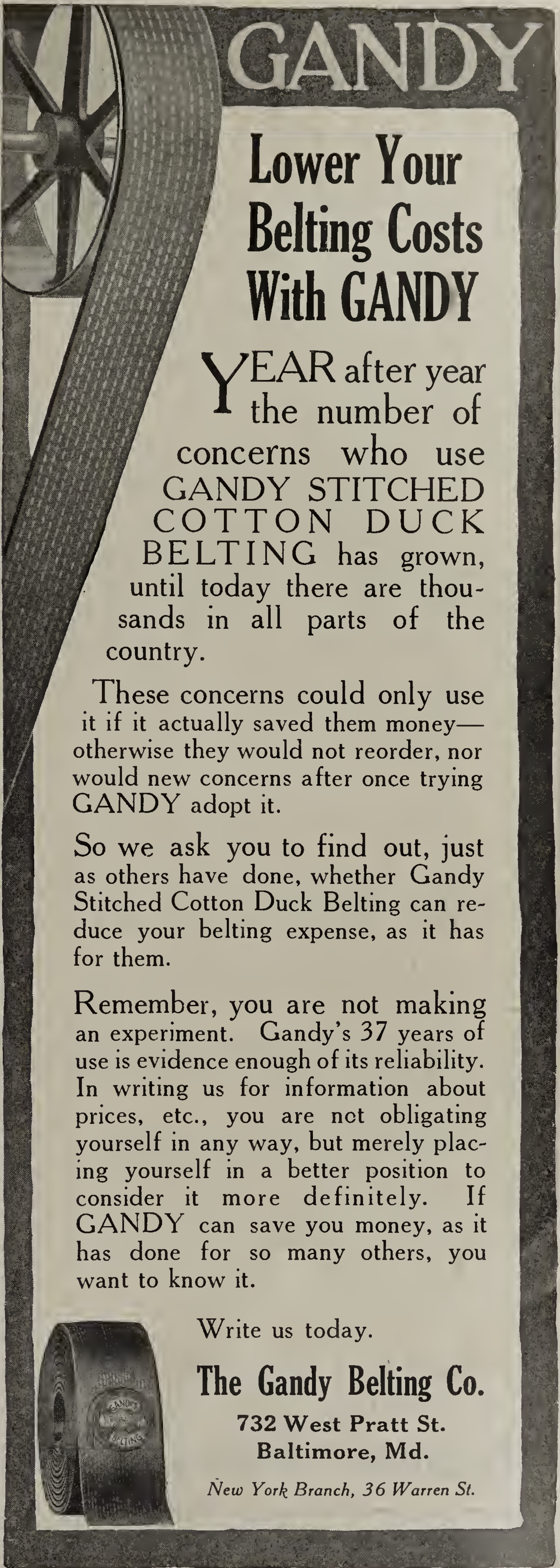
"Production during the past year was double that of 1914 and we are now making preparations to double our 1915 production during the ensuing year," declared M. L. Pulcher, vice-president and general manager of the Federal Motor Truck Company, while discussing the ever-increasing demand for Federal trucks.

"We are constructing new buildings that the production may be increased, and anticipate that 1916 will be the most successful year in the history of our corporation. Orders from thruout the United States and from foreign countries are being received daily, and every department at our plant is being operated to full capacity to keep pace with the big demand.

"An analysis of the recent orders received from our dealers scattered in all parts of the world, shows conclusively that purchasers of Federal trucks are our greatest advertisers. In giving reasons why they had selected Federals in preference to other motor trucks, these new owners declared in almost every instance that they had investigated personally whether the Federal trucks owned in their vicinity were giving satisfaction. High recommendations from manufacturers and business men who have owned Federals for several years led these new purchasers to join the army of Federal owners.

"Many recent buyers stated that they were much interested in our tables which show the comparison cost in practically all lines of business for horse-drawn equipment and Federal trucks. Other reasons for buying Federals were that all parts of our truck can be bought at exactly the same cost as the new truck and that all parts are standard and manufactured by big corporations making a specialty in some particular line such as motors, transmissions, axles, etc."

J. F. Bowman, director of sales of the Federal company, asserts that the number of Federal dealers has been greatly increased during the past twelve months, and that every representative of the company expects to make a wonderful showing during 1916.



GANDY

Lower Your Belting Costs With GANDY

YEAR after year the number of concerns who use GANDY STITCHED COTTON DUCK BELTING has grown, until today there are thousands in all parts of the country.

These concerns could only use it if it actually saved them money—otherwise they would not reorder, nor would new concerns after once trying GANDY adopt it.

So we ask you to find out, just as others have done, whether Gandy Stitched Cotton Duck Belting can reduce your belting expense, as it has for them.

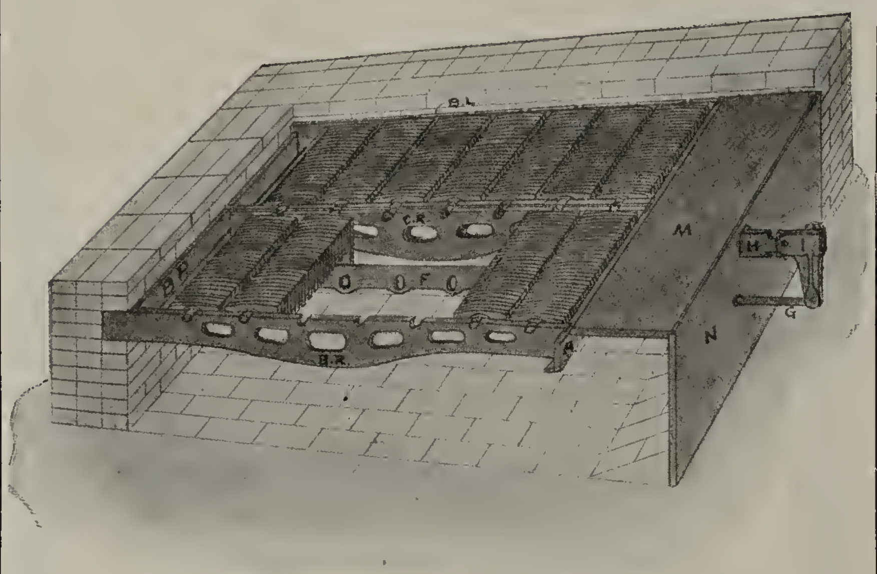
Remember, you are not making an experiment. Gandy's 37 years of use is evidence enough of its reliability. In writing us for information about prices, etc., you are not obligating yourself in any way, but merely placing yourself in a better position to consider it more definitely. If GANDY can save you money, as it has done for so many others, you want to know it.

Write us today.

The Gandy Belting Co.
732 West Pratt St.
Baltimore, Md.
New York Branch, 36 Warren St.

SAY I SAW IT IN BRICK AND CLAY RECORD

IF YOU DON'T USE BOILERS
you will not need
The Cyclone Grates—
IF YOU DO USE BOILERS
Then you should use them



We are so confident that you need them—that we are selling

Cyclone Grates
On 90 Days' Trial

They have never yet failed to cut the fuel cost—and how can they fail with you?

Can you afford to continue using grates that are burning one, two, three more tons of coal each day than is necessary to keep up pressure?

Of course you can't!

Send now for catalog.

Cyclone Grate-Bar Co.
BUFFALO, N. Y.

"We are giving our domestic business especial attention at the present time," said Mr. Bowman, "although we are receiving many orders for trucks from foreign countries. However, we are not attempting to make 'war' trucks and will centralize our efforts on supplying the demand for trucks to be used in the business world.

"One instance of the high standing of Federal trucks was brought to the attention of the whole world during the past year when the Jury of Awards at the Panama-Pacific Exposition awarded the Federal Motor Truck Company the gold medal. This was particularly significant because we were competing for honors against trucks of all capacities, while our exhibit was of only two capacities—1½ and 3½ ton models."

Chain Hoists For the Clay Plant

A chain hoist should be included in the tool equipment of every plant. There are so many instances arising where it is necessary to lift, for a few seconds or minutes, the heavy machines, or the parts of machines, that a hoist is indispensable.

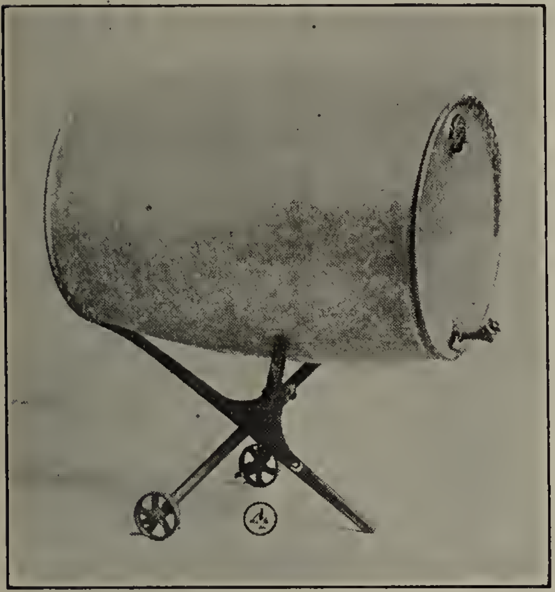
On all plants that change dies often, it will be found an excellent plan to have a light chain hoist hanging permanently over the head of the auger, particularly so in fireproofing and in drain tile plants, where the multitude of shapes demands frequent changes of dies; and, of course, these dies must be changed quickly in order that the time of the department may not be wasted. The hoist enables one man to do the work speedily. It is usually mounted on a steel overhead trolley track parallel to axis of auger.

Changing dies is not the limit of the hoists usefulness by any means. In putting in new gears, shafting, heavy pulleys, mullers and boilers and all similar work, the Wright chain hoist plays an efficient, important part.

In the one item of time-saving alone, it is worth its cost in just a few months' time. Send for the catalog and select the size you need, from The Wright Manufacturing Company, Lisbon, Ohio.

It Supports the Oil Barrels

To make it possible to do away with the old method of pumping barrels of oil into tanks, and to have the barrels up off the floor of the oil house or engine room, The Barrel Hoisting Jack Truck and Stand was designed.


Garnet Support for Oil Barrels

With the Jack-Truck-Stand one man can easily handle a 600-pound barrel, and it is a simple matter to truck the wheeled barrel into its place.

The Garnet Company, of Allentown, Pa., who manufacture Garnet Belt-treating Products, are also sponsors for this appliance, and guarantee it to do all that is claimed.

What Are You Going to Do About It?

That phrase "Buy Well" has certainly made a deep impression on every reader of "Brick and Clay Record," both subscribers and advertisers. But consider this—Does it stop with machinery bought well? Doesn't it also include your coal?

Let us presume that you are manufacturing and burning 10,000,000 brick per year, or its equivalent tonnage in some other type of clay product. It is safe to say that you are buying and burning 5,000 tons of coal, and if you are paying $1.75 per ton your coal bill for the year will amount to $8,750.00—truly a fancy figure.

Now accept these statements (if you don't believe them now, accept them anyway and prove or disprove them later). The real cost of your coal is not contained in the figures at the southeast corner of your monthly coal bill. Any feature of your coal that prolongs the time of burning is a positive function of coal cost. Any feature of your coal that causes expensive clinkers and stagnant fires is a positive function of coal cost, and they must be considered in your analysis of the true cost of your coal.

To wit: A short-flame, flashy coal prolongs the burn; it adds days to the burning time, tieing up the kiln equipment, consuming an additional tonnage of coal, and requiring a labor expenditure for firemen of from $4.00 to $8.00. In addition—a short flame coal causes local heat in the bags and top, and the bottom is usually soft and the top scorched and overburned.

That isn't all, but enough for the present. Now—can you afford it? Are your feelings outraged, when you consider that you have been contentedly buying low heat, short flame, impure coal by the thousands of tons each year, a coal that has levied and collected cost tribute at every turn—a coal that, if the proper cost figures could be determined, would approach nearer to $4.00 per ton than your present price?

"Premium" coal, mined and sold by The Big Creek Colliery Company of Chicago, is high in B.T.U. It is pure, it has a long sustained flame, that burns hard to the kiln floor, evenly, thoroly and quickly.

Supply Your Engineer with Money-Saving Mechanical Rubber Goods

Help your engineer and other mechanics to get the highest results at the least cost. Here are "first aids" to maximum efficiency at minimum expense—service considered.

P.P.P. Rod Packing
Reg. U. S. Pat. Off.

Ebonite Sheet Packing

Hercules Conveyor Belt

Ebonite Pump Valves

Our 1916 Catalogue, 180 pages, profusely illustrated, is just off the press, and should be in the hands of every live-wire brick or clay plant superintendent.

This is an expensive book, and we want it to go only to the right man—you, the superintendent or owner, therefore please use your company's letterhead when you write—"Send me my copy of your Catalogue."

QUAKER CITY RUBBER CO.

PHILADELPHIA
629 Market Street

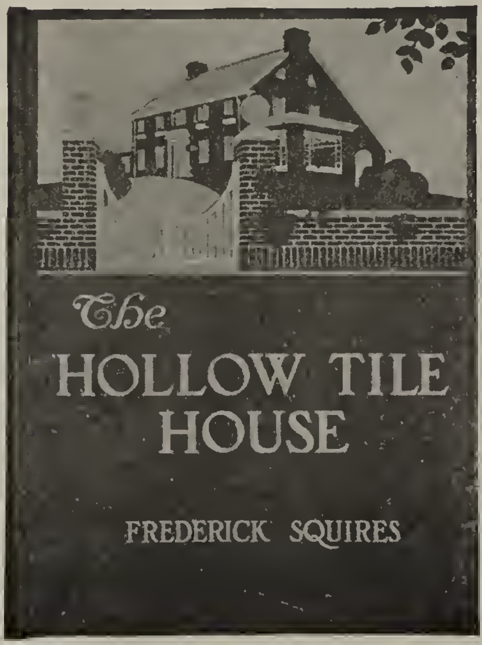
CHICAGO
182 West Lake Street

PITTSBURGH
211 Wood St.

NEW YORK
207 Fulton Street

If you make, sell or use Burned Clay Fireproofing

You Need This Book



THE HOLLOW TILE HOUSE

by Frederick Squires

is brim full of valuable information and good reading matter on this new field of hollow tile in residential construction, its history, how the tile is laid up, cost data and a host of other interesting subjects, all of which is skilfully woven by the author into a very fascinating story. A large number of illustrations give the reader an idea of the architectural beauties and possibilities of the hollow tile house. It will be time well invested to read this book.

ORDER A COPY NOW.

PRICE $2.50

Book Department

Brick and Clay Record
CHICAGO

The Buyers' Directory Of Clay Products Machinery Manufacturers

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Broderick & Bascom Rope Co.
Ambursen Co.

Asbestos Roofings.
Johns-Manville Co., H. W.

Automobile Trucks.
Federal Motor Truck Co.
Kissel Motor Car Co.

Babbitt Metal.
Cleveland Alloys Co.
Gerlock, H. W.

Barrows and Trucks.
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Chambers Bros. Co.
Chicago Brick Machy. Co.
Manufacturers Equipment Co.
Stevenson Co.
Toronto Fdry. & Machine Co.

Barytes, Carbonate of.
Gabriel & Schall.
Roessler Hasslacher Chem. Co.

Belts.
Ceramic Supply & Cons. Co.
Gandy Belting Co.
Main Belting Co.
Manufacturers Equipment Co.
Quaker City Rubber Co.
Sawyer Belting Co.
Scandinavia Belting Co.

Belt Conveyors.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Gandy Belting Co.
Link-Belt Co.
Main Belting Co.
Manufacturers Equipment Co.
Scandinavia Belting Co.
Weller Mfg. Co.

Belt Fasteners.
Crescent Belt Fastener Co.

Blasting Machines.
Ceramic Supply & Cons. Co.

Blocks.
Broderick & Bascom Rope Co.

Blowers.
American Blower Co.
Manufacturers Equipment Co.
Trautwein Dryer & Eng. Co.

Boilers.
(See Engines and Boilers.)

Brick Conveyors.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Link-Belt Co.
Manufacturers Equipment Co.

Brick-Handling Machinery.
Mathews Gravity Carrier Co.

Brick Machines (Dry Press).
Ceramic Supply & Cons. Co.
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Illinois Supply & Cons. Co.

Brick Machines (Soft Mud).
Eastern Machy. Co.
Manufacturers Equipment Co.

Brick Machines (Stiff Mud).
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Stevenson Co.

Cables and Cableways.
Broderick & Bascom Rope Co.

Cars, Trucks and Turntables.
Atlas Car & Mfg. Co.
Ceramic Supply & Cons. Co.
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Chase Fdry. & Mfg. Co.
Gerlock, H. W.
Manufacturers Equipment Co.
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Pettigrew Foundry Co.
Toronto Fdry. & Machine Co.
Weller Mfg. Co.

Castings.
Chambers Bros. Co.
Gerlock, H. W.
Link-Belt Co.
Manufacturers Equipment Co.
Toronto Fdry. & Machine Co.

Cement.
Lehigh Portland Cement Co.

Chains (Steam Shovel).
Woodhouse Chain Works.

Clay Feeders and Mixers.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Manufacturers Equipment Co.
Marion Mach. Fdy. & Sup. Co.
Schaffer Eng. & Eq. Co.
Stevenson Co.

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Clearfield Machine Shops.
Link-Belt Co.
Weller Mfg. Co.

Clay Plants Complete.
Atlas Car & Mfg. Co.
Chambers Bros. Co.
Gerlock, H. W.
Manufacturers Equipment Co.
Trautwein Dryer & Eng. Co.
Weller Mfg. Co.

Clutches (Friction).
Chambers Bros. Co.
Link-Belt Co.
Schultz & Son, A. L.
Weller Mfg. Co.

Contracting Engineers and Machinists.
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Chambers Bros. Co.
Manufacturers Equipment Co.
Smith Co., Claude.

Conveying Machinery.
Chambers Bros. Co.
Link-Belt Co.
Mathews Gravity Carrier Co.
Weller Mfg. Co.
Scandinavia Belting Co.

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Broderick & Bascom Rope Co.

Counters.
Ceramic Supply & Cons. Co.

Couplings.
Bruce-Macbeth Engine Co.

Crushers.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Manufacturers Equipment Co.

THE BUYERS' DIRECTORY—Continued

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Crawford & McCrimmon Co.
Manufacturers Equipment Co.
Marion M., Fdry. & Sup. Co.

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Chambers Bros. Co.
Manufacturers Equipment Co.
Webb Wire Works.

Dies.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Manufacturers Equipment Co.

Disintegrators.
Chambers Bros. Co.
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Manufacturers Equipment Co.
Marion M. Fdry. & Supply Co.

Door Carriers (Dry Kiln).
Dry Kiln Door Carrier Co.

Dryer Cars.
(See Cars.)

Dryers.
American Process Co.
Chambers Bros. Co.
Jackson & Church Co.
Manufacturers Equipment Co.
Philadelphia Textile Machy. Co.
Standard Dry Kiln Co.
Trautwein Dryer & Eng. Co.

Dryers (Sand).
American Process Co.
Ceramic Supply & Cons. Co.
Jackson & Church Co.
Schaffer Eng. & Eq. Co., The.

Dry Pans.
Chambers Bros. Co.
Chicago Brick Machy. Co.
Eagle Iron Works.
Jackson & Church Co.
Manufacturers Equipment Co.
Stevenson Co.

Dynamos and Generators.
Westinghouse Elec. & Mfg. Co.

Electric Shovels.
Link-Belt Co.
Marion Steam Shovel Co.
Thew Automatic Shovel Co.

Electrical Furnaces.
Engelhard, Chas.

Electrical Instruments.
Brown Instrument Co.
Engelhard, Chas.
Taylor Instrument Companies.

Elevator Buckets.
Link-Belt Co.
Manufacturers Equipment Co.
Weller Mfg. Co.

Elevators and Conveyors.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Gandy Belting Co.
Link-Belt Co.
Main Belting Co.
Manufacturers Equipment Co.
Mathews Gravity Carrier Co.
Toronto Fdry. & Machine Co.
Weller Mfg. Co.

Engineers.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Link-Belt Co.
Manufacturers Equipment Co.
Schaffer Eng. & Eq. Co.
Smith Co., Claude.
Trautwein Dryer & Eng. Co.

Engines (Gas).
Bruce-Macbeth Engine Co.

Engines and Boilers.
Bruce-Macbeth Engine Co.
Jackson & Church Co.
Manufacturers Equipment Co.
Murray Iron Wks. Co.

Fans.
American Blower Co.
Murray Iron Works Co.
Trautwein Dryer & Eng. Co.

Feed Water Heaters.
Jackson & Church Co.
Murray Iron Wks. Co.

Filter Presses.
Baird Machine & Mfg. Co.
Stevenson Co.

Flexible Shaft.
Bruce-Macbeth Engine Co.

Flower Pot Machinery.
Baird Machine & Mfg. Co.

Flue Blowers.
Marion Mach. Fy. & Sup. Co.

Frogs and Switches.
Atlas Car & Mfg. Co.
Buckeye Rolling Mill Co.
Cincinnati Frog & Switch Co.
Toronto Fdry. & Machine Co.

Furnaces.
Ill. Supply & Cons. Co.
Trautwein Dryer & Eng. Co.
Smith Co., Claude.

Gasoline Shovels.
Marion Steam Shovel Co.
Thew Automatic Shovel Co.

Gears.
Baird Machine & Mfg. Co.
Chambers Bros. Co.
Link-Belt Co.
Manufacturers Equipment Co.
Nuttall Co., R. D.
Schultz & Son, A. L.
Toronto Fdry. & Machine Co.
Weller Mfg. Co.

Grates and Grate Bars.
Canton Grate Co.
Chambers Bros. Co.
Chicago Brick Machy. Co.
Cyclone Grate Bar Co.
Gerlock, H. W.
Jackson & Church Co.
Manufacturers Equipment Co.
Marion Machine, Fdry. & Sup Co.
Martin Grate Co.
Murray Iron Wks. Co.
Smith Co., Claude.
Toronto Fdry. & Machine Co.

Gravity Carrier.
Mathews Gravity Carrier Co.

Grease.
Stock Xylite Grease & Oil Co.

High Temperature Cements.
Johns-Manville Co., H. W.

Hoists.
Chambers Bros. Co.
Link-Belt Co.
Manufacturers Equipment Co.
Weller Mfg. Co.

Hollow Block Machinery.
Chambers Bros. Co.
Manufacturers Equipment Co.

Hygrometers or Moisture Indicators.
Taylor Instrument Companies.

Kilns.
Chambers Bros. Co.
Didier-March Co.
Hook Patent Kiln Co.
Illinois Supply & Cons. Co.
Manufacturers Equipment Co.
McManigal Grateless Furnace Co.
Ohio Kiln Co.
Schaffer Eng. & Eq. Co., The
Smith Co., Claude.

Kiln Doors and Frames.
Gerlock, H. W.
Manufacturers Equipment Co.
Smith Co., Claude.

Kiln Lugs and Bands.
Gerlock, H. W.
Smith Co., Claude.

Lime Mixer.
Gerlock, H. W.

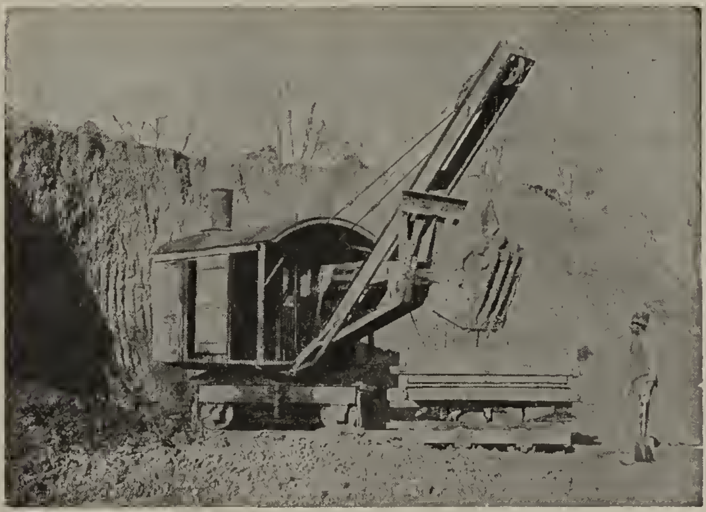
Link Belting.
Link-Belt Co.

THE THEW SHOVELS

Would You Like to Know Just What It Costs Others to Dig Clay and Shale?

THEN JUST ASK

for Circular 22 A. In it is compiled a record of actual results gathered from 55 different clay plants, many with conditions identical to your own. Cost per ton, per yard, and per thousand of brick are given, several photos of clay pits are shown, and other information incorporated of a character that will interest all clayworkers.



Thew Shovel which saves wages of 10 men every day

There are now

Over 300 Thew Shovels in the Clayworking Industry

a fact which conclusively proves their great adaptability for the conditions peculiar to this work.

The Horizontal Crowding Motion and other Thew features of particular advantage in this work are also fully described in this circular.

This is just another booklet such as business men are anxious to read in order to keep abreast of the times with reference to their industry.

Send for your copy today.

SIGN AND MAIL OR USE FOR MEMORANDUM

The Thew
Automatic
Shovel Co.
Lorain, Ohio

Send me circular 22 A, giving cost facts for digging clay and shale and other information of interest as advertised in "Brick and Clay Record."

Name..........................

Address..........................

THE THEW AUTOMATIC SHOVEL CO. LORAIN OHIO

SAY "I SAW IT IN" BRICK AND CLAY RECORD

The Modern Means of Transporting Brick

FEDERAL
MOTOR TRUCKS

To keep up with modern methods and modern competition it is absolutely necessary to deliver your products wherever they may be required, without delay.

Federal Motor Trucks will speed up your deliveries, thereby pleasing your customers with the prompt attention their orders receive.

Federalized Transportation will greatly increase the territory in which you can profitably sell your brick and clay products. This is due to the ability of Federal Trucks to cover much greater distances than the old methods.

You are vitally interested in cutting all possible corners in the running expenses of your business. How about your Traffic Department? Is it using the horse drawn methods of "Yesterday" or the "up-to-the-minute" Federalized Transportation?

Our Department of Traffic Engineering can show the great saving of Federal Trucks in the brick and clay products business. May we show you how the Federal Way is the road of low cost handling?

Federal Motor Truck Company
482-490 Leavitt Street
Detroit Michigan

THE BUYERS' DIRECTORY—Continued

Locomotive Cranes.
Link-Belt Co.

Locomotive (Electric).
Atlas Car & Mfg. Co.

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Baldwin Locomotive Works.

Locomotives (Steam).
Dewey Bros.
Davenport Locomo. Works.

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Stock Xylite Grease & Oil Co.

Manganese.
Roessler & Hasslacher Chemical Co.

Mechanical Draft.
Trautwein Dryer & Eng. Co.

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Baird Machine & Mfg. Co.
Gerlock, H. W.
Manufacturers Equipment Co.

Mold Sanders.
Manufacturers Equipment Co.

Motors—Electric.
Westinghouse El. & Mfg. Co.

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Stock Xylite Grease & Oil Co.

Oil Burners.
Chicago Brick Machy. Co.
Illinois Supply & Cons. Co.
Weller Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Oil Engines.
Chicago Brick Machy. Co.
Weller Mfg. Co.

Oil Test Instruments.
Taylor Instrument Companies.

Packings.
Johns-Manville Co., H. W.
Quaker City Rubber Co.

Pans—Dry Pans, Wet Pans, Clay or Chaser Mills Combination Tempering Pans.
Chambers Bros. Co.
Manufacturers Equipment Co.

Pallets and Trays.
Ohio Galvanizing & Mfg. Co.

Patents.
Peck, Hubert E.

Paving Brick Filler (Cement).
Lehigh Portland Cement Co.

Perforated Sheet Metal.
Ceramic Supply & Cons. Co.
Hendrick Mfg. Co.

Pipe Coverings.
Johns-Manville Co., H. W.

Poldometers.
Schaffer Eng. & Eq. Co.

Portable Track.
Atlas Car & Mfg. Co.
Buckeye Rolling Mill Co.
Cincinnati Frog & Switch Co.
Manufacturers Equipment Co.
Standard Dry Kiln Co., The.

Potters' Machinery.
Baird Machine & Mfg. Co.
Toronto Fdry. & Machine Co.

Power Plant Equipment (Complete).
Jackson & Church Co.
Link-Belt Co.
Murray Iron Wks. Co.
Taylor Instrument Companies.
Trautwein Dryer & Eng. Co.
Weller Mfg. Co.

Power Transmission.
Link-Belt Co.

Presses—Sewer Pipe and Tile, Nozzle and Sleeve, Tuyere and Shape Brick.
Baird Machine & Mfg. Co.

Producer Gas Engines.
Bruce-Macbeth Engine Co.

Pug Mills.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Manufacturers Equipment Co.
Schultz & Son, A. L.
Stevenson Co.

Pulleys—Cast Iron, Clutch and Wood.
(See Supplies.)

Pulverizers.
Chicago Brick Machinery Co.
Manufacturers Equipment Co.

Pumps.
Ceramic Supply & Cons. Co.

Pyrometers.
Beighlee Electric Co.
Bristol Co.
Brown Instrument Co.
Ceramic Supply & Cons. Co.
Englehard, Chas.
Price Electric Co.
Sander Instrument Co.
Stupakoff Laboratories.
Taylor Instrument Companies.
Thwing Instrument Co.
Trautwein Dryer & Eng. Co.

Quartz Glass Articles.
Englehard, Chas.

Rails (Frogs and Switches).
Atlas Car & Mfg. Co.
Buckeye Rolling Mill Co.
Cincinnati Frog & Switch Co.
Foster Co., L. B.
Frank, M. K.

Railway Equipment (Industrial).
Atlas Car & Mfg. Co.
Buckeye Rolling Mill Co.
Ceramic Supply & Cons. Co.
Cincinnati Frog & Switch Co.
Davenport Loco. Works.
Foster Co., L. B.
Gerlock, H. W.
Manufacturers Equipment Co.
Toronto Fdry. & Machine Co.

Rattler.
Ceramic Supply & Cons. Co.
Manufacturers Equipment Co.

Recording Gages.
Brown Instrument Co.
Ceramic Supply & Cons. Co.
Price Electric Co.
Sander Instrument Co.
Taylor Instrument Companies.

Represses.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Chicago Brick Machinery Co.

Resistance Thermometers.
Englehard. Chas.

Revolution Indicators.
Brown Instrument Co.
Ceramic Supply & Cons. Co.

Roofing Tile Machinery.
Manufacturers Equipment Co.

Rope (Wire and Manila).
Broderick & Bascom Rope Co.
Manufacturers Equipment Co.

Sand Dryers.
American Process Co.
Jackson & Church Co.
Schaffer Eng. & Eq. Co.

Sand Lime Brick Machinery.
Ceramic Supply & Cons. Co.
Chicago Brick Machy. Co.
Illinois Supply & Cons. Co.
Jackson & Church Co.
Manufacturers Equipment Co.

Scrapers, Plows and Clay Gatherers.
Eagle Iron Works.
Schofield-Burkett Cons. Co.

Screens (Clay and Cement).
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
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Link-Belt Co
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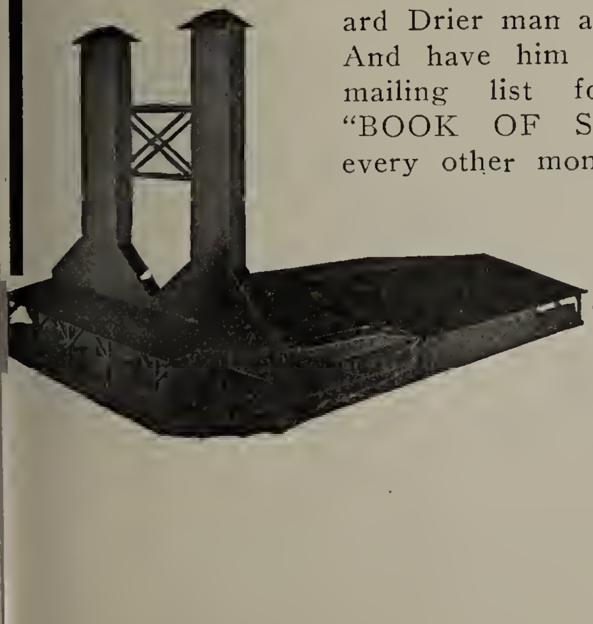

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is regrinding and renewable. All parts replaced with ease. It is unconditionally guaranteed for this work.
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Strictly hand welded by expert workmen and made from a special rerolled double refined iron.
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Machinery and Supplies for Brick Yards and Clay Mining. Shafting, Pulleys, Hangers, Belting, Wire Rope, Roofing Materials, Fire Brick.
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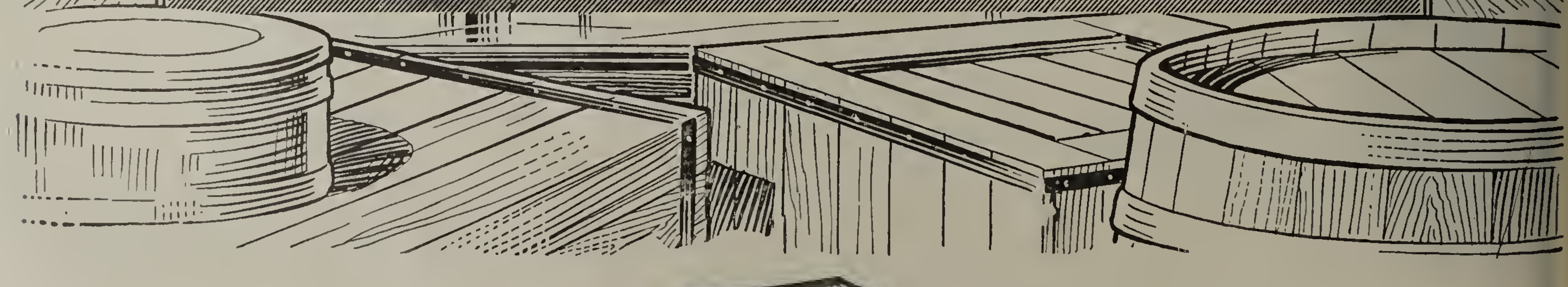

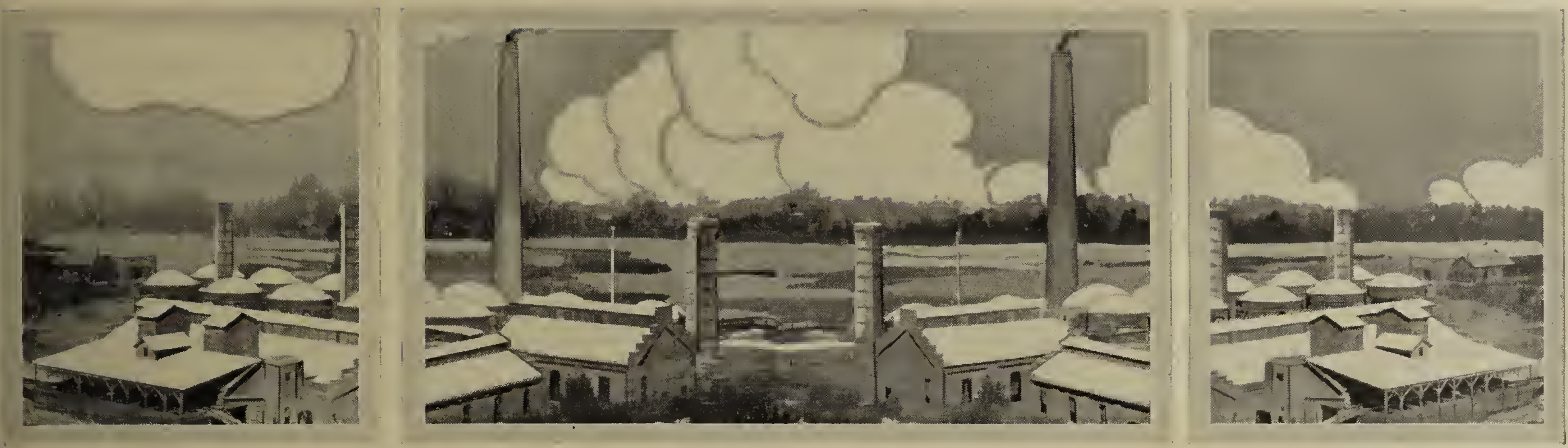

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A treatment that eliminates a large portion of waste—the clay worker's greatest problem today. Fuel waste, time waste and depreciation in the value of the finished product and in the kiln can be traced to air and gas leaks through the masonry and to the failure of the brick work.

J-M HEAT TREATMENT

aids in producing a better and constant up-draft through the stack, thus facilitating the control of temperature.

J-M Heat Treatment comprises two high temperature cements, **No. 31 and No. 32.**

No. 31 J-M High Temperature Cement is used as a mortar in setting up fire brick. It vitrifies at a low kiln temperature and will not fuse under 3187 degrees F.

It protects the brick edges from excessive heating, which is disastrous to their life, by sealing all the spaces between them.

No. 32 J-M High Temperature Cement is applied to the brick surface that is exposed to the fire. It also vitrifies at a low temperature and forms a protective coating that will not crack, blister or spawl despite intense heat and varying temperature.

For Pottery Saggers

No. 32 J-M High Temperaure Cement should be painted over the saggers to prevent the inflow of damaging kiln gases, which are a constant danger to china and stone ware. It greatly increases the life of the sagger by preventing fissures and spawling.

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- Asbestos Gloves
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SAY I SAW IT IN BRICK AND CLAY RECORD

The "Proctor" Drying System

Our claims for it—

CLAIM NO. 1: Cuts drying time from 50 to 90 per cent over all other systems—this percentage depending upon the product and the nature of clay or shale.

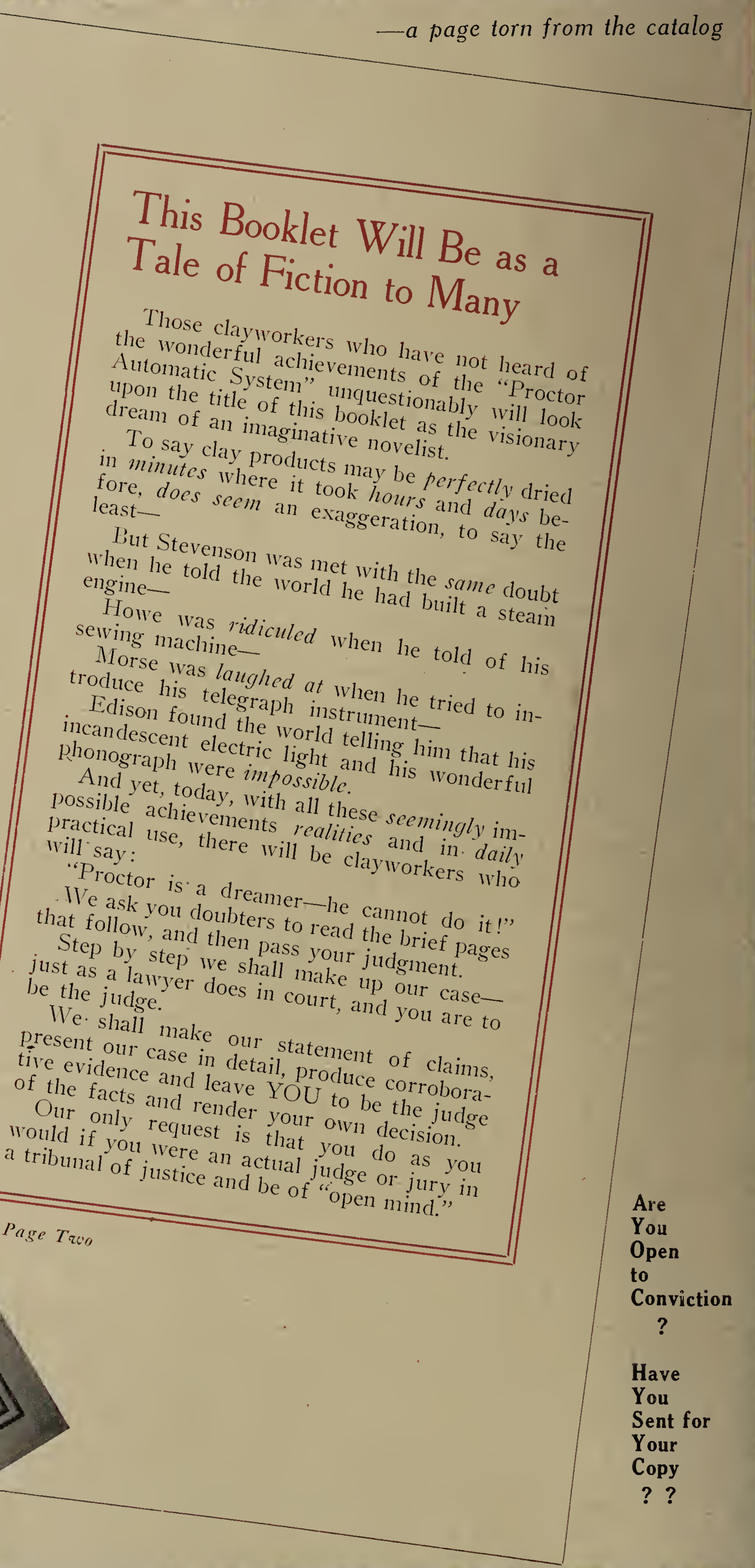
CLAIM NO. 2: Cuts down number of dryer cars from 50 to 80 per cent over all other systems, this number varying according to kind of product.

CLAIM NO. 3: Cuts down labor cost from 40 to 75 per cent over all other systems, this percentage varying with the nature of the product and the general efficiency of the other equipment.

CLAIM NO. 4: Cuts down percentage of waste, as compared with other systems and practically eliminates all waste in most ware.

The Philadelphia Textile Machinery Company

Hancock and Somerset Sts.
Philadelphia
Pa.



—a page torn from the catalog

This Booklet Will Be as a Tale of Fiction to Many

Those clayworkers who have not heard of the wonderful achievements of the "Proctor Automatic System" unquestionably will look upon the title of this booklet as the visionary dream of an imaginative novelist.

To say clay products may be *perfectly* dried in *minutes* where it took *hours* and *days* before, *does seem* an exaggeration, to say the least—

But Stevenson was met with the *same* doubt when he told the world he had built a steam engine—

Howe was *ridiculed* when he told of his sewing machine—

Morse was *laughed at* when he tried to introduce his telegraph instrument—

Edison found the world telling him that his incandescent electric light and his wonderful phonograph were *impossible.*

And yet, today, with all these *seemingly* impossible achievements *realities* and in *daily* practical use, there will be clayworkers who will say:

"Proctor is a dreamer—he cannot do it!"

We ask you doubters to read the brief pages that follow, and then pass your judgment.

Step by step we shall make up our case—just as a lawyer does in court, and you are to be the judge.

We shall make our statement of claims, present our case in detail, produce corroborative evidence and leave YOU to be the judge of the facts and render your own decision.

Our only request is that you do as you would if you were an actual judge or jury in a tribunal of justice and be of "open mind."

Page Two

Are You Open to Conviction ?

Have You Sent for Your Copy ? ?

BIR

BRICK and CLAY RECORD

BROWN PYROMETERS

Recording Instruments in Office

View of the Kilns

Indicating Instruments in Burner's Shanty

The Metropolitan Paving Brick Co., Canton, Ohio, has a Brown Pyrometer installation at their Imperial Plant, shown above.

Look over a list of the foremost clay products manufacturers and you will find that 90 per cent are equipped with Brown Pyrometers. There's a reason—ask any user, he can tell you why.

See our exhibit during the convention, Room 339, Hotel Statler, Cleveland.

The Brown Instrument Company

PHILADELPHIA, PA.

NEW YORK PITTSBURGH CHICAGO

Vol. XLVIII, No. 3 **Chicago** **February 1, 1916**

WELLER-MADE

A large Ohio hollow brick manufacturer found that they were spending entirely too much money in handling coal.

Labor was scarce and high and the available supply did not like to unload and handle coal—besides they were needed in the pit and at other points around the plant.

It was not practical to stock any amount of coal on the ground either economically or conveniently.

They had to unload coal in three or four different places to take care of all of their kilns—as well as their power plant.

Coal shipped in gondola cars in this district costs from five to ten cents per ton over that loaded in drop bottoms or "battleships".

Coal cars were in the way of empties to be loaded with finished products, and many times coal was needed at boiler house when cars were placed near the kilns.

Lots of coal fell between wagons and cars, and was ground into the dirt by carts, teams, etc.

Their retail trade had grown to a large, substantial and desirable business that could not be taken care of economically, and they were not able to take care of new and desirable orders.

This condition was no different from that existing in many other good live clayworking plants, and the management was as good, if not considerably above that in the average plant.

Business had grown and new conditions had developed that had not been foreseen, and they were face to face with a serious situation.

THE SOLUTION

The solution of this serious problem turned out to be a simple one.

We simply went over the proposition and in the end installed a system consisting of a Steel Track Hopper, Reciprocating Feeder, a "V" Bucket type of combined Elevator and Conveyor, delivering coal to a Distributing Conveyor which in turn delivers to a battery of 3 Weller Unit-System Storage Bins.

Large lump Youghiogheny coal is now delivered to their plant in drop bottom cars.

Instead of five or six men being put to work on unloading, one man simply opens the gates of the hoppered bottom.

The coal drops down into the big steel Track Hopper, and the Reciprocating Feeder passes it on to the Elevator where buckets about 20 inches wide and 30 inches long pick it up and carry it up vertically about 40 ft. and horizontally about 15 ft., **passing the coal over a bar screen,** which takes out the fine coal 2½ inches and under; spouting same directly to the boiler room.

The lumps are delivered to the Distributing Conveyor which delivers to any one of the three bins.

Carts or auto trucks drive under the bins and by simply opening the gate **the driver** loads his own vehicle in a few seconds and is on his way.

The owners of this installation claim that **the saving from theft and coal dropped on the ground will more than pay the interest on the investment.**

In addition, they have an overhead storage of approximately 300 tons of coal, one man can unload the largest car and put it in the bins in two hours, delivering the fine coal to the boiler room, and only 7½ H. P. is required.

In other words, the actual cost of unloading and putting this coal into wagons or carts or to the boiler house, including labor, power and interest and depreciation is less than 4c per ton.

We Can Furnish You An Outfit To Meet Your Requirements

Send for Catalogs J-20-25-32

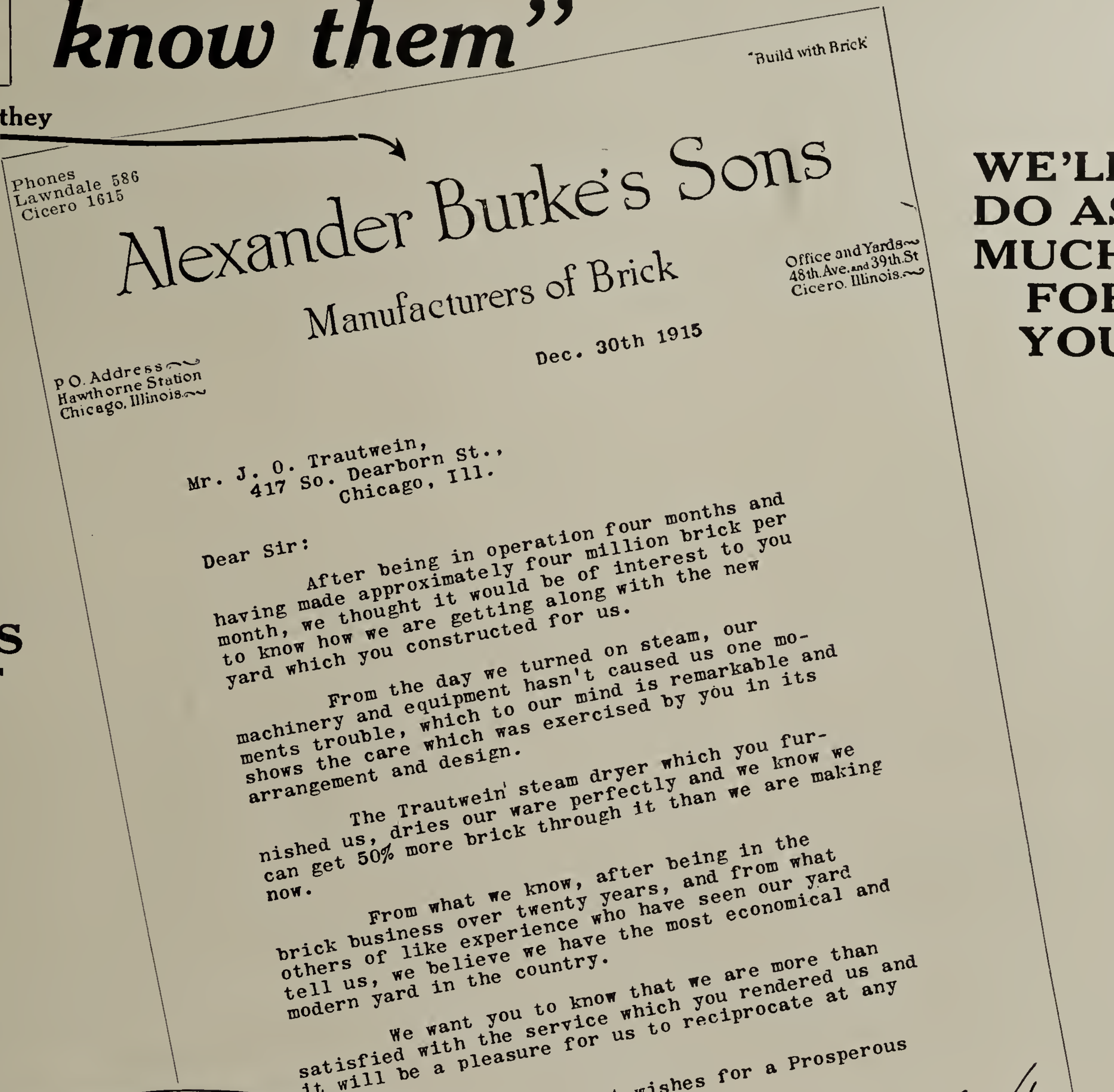
Weller Manufacturing Company
CHICAGO

SAY I SAW IT IN
BRICK AND CLAY RECORD

Trautwein DRYERS

"By their deeds ye shall know them"

Here's what they say about us →



"Build with Brick"

Phones
Lawndale 586
Cicero 1615

Alexander Burke's Sons
Manufacturers of Brick

Office and Yards
48th Ave. and 39th St
Cicero, Illinois.

P.O. Address
Hawthorne Station
Chicago, Illinois.

Dec. 30th 1915

Mr. J. O. Trautwein,
417 So. Dearborn St.,
Chicago, Ill.

Dear Sir:

After being in operation four months and having made approximately four million brick per month, we thought it would be of interest to you to know how we are getting along with the new yard which you constructed for us.

From the day we turned on steam, our machinery and equipment hasn't caused us one moments trouble, which to our mind is remarkable and shows the care which was exercised by you in its arrangement and design.

The Trautwein steam dryer which you furnished us, dries our ware perfectly and we know we can get 50% more brick through it than we are making now.

From what we know, after being in the brick business over twenty years, and from what others of like experience who have seen our yard tell us, we believe we have the most economical and modern yard in the country.

We want you to know that we are more than satisfied with the service which you rendered us and it will be a pleasure for us to reciprocate at any me.

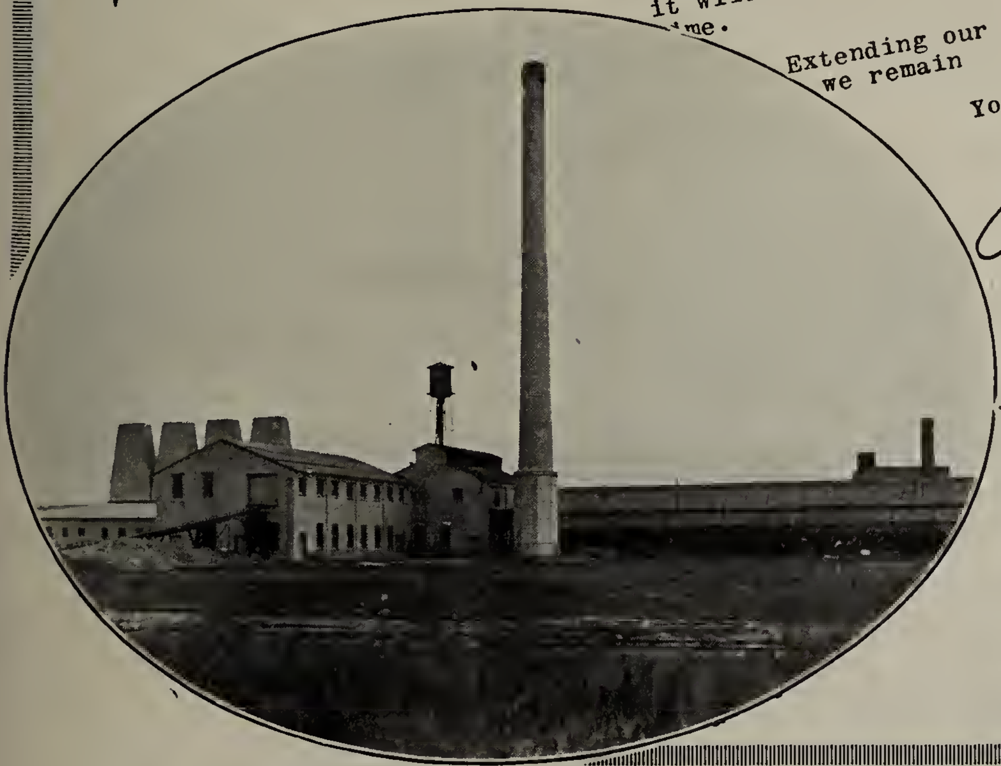
Extending our best wishes for a Prosperous
we remain

Yours very truly

Alexander Burke's Sons

WE'LL DO AS MUCH FOR YOU

THIS IS WHAT WE DID



Trautwein Dryer & Engineering Co.

ENGINEERS

417 S. Dearborn St., Chicago, U. S. A.

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Did This Ever Occur to You?

If you could find the time, and afford the cost, don't you think you would get a world of valuable information by visiting even a score of clay plants this year?

Perhaps you would see a crusher, a dryer, a kiln, a new method of handling the green and the burned ware. You would most certainly adopt some of these for your own plant because every progressive manufacturer of clay products is keen for more efficient methods.

Well—you don't have to spend any money for travelling expense—nor will it take much of your time—to know of machinery, equipment and methods that are helping your brother clay-products manufacturers to decrease their costs of operation—to make a better product.

"Brick and Clay Record"—your partner in efficiency—visits these plants for you. Every day of every year we are in direct touch with several thousand plants—and during the year our organization finds time to visit personally scores of the best equipped plants in the country.

We find out what others are doing—we tell you about them in printed word and pictures—then to make this of greatest practical value to you, we find out where you can obtain such machinery, equipment or methods we describe.

That's the reason our Advertising pages are as vital to you as the Editorial. Be sure you use them—in this very issue you'll find mighty interesting and valuable offerings.

Standards of Practice for Business Papers

1. To consider, first, the interests of the subscriber. 2. To subscribe to and work for truth and honesty in all departments. 3. To eliminate, in so far as possible, his personal opinions from his news columns, but to be a leader of thought in his editorial columns, and to make his criticisms constructive. 4. To refuse to publish "puffs," free reading notices or paid "write-ups;" to keep his reading columns independent of advertising considerations, and to measure all news by this standard: "Is it real news?" 5. To decline any advertisement which has a tendency to mislead or which does not conform to business integrity. 6. To solicit subscriptions and advertising solely upon the merits of the publication. 7. To supply advertisers with full information regarding character and extent of circulation, including detailed circulation statements subject to proper and authentic verification. 8. To co-operate with all organizations and individuals engaged in creative advertising work. 9. To avoid unfair competition. 10. To determine what is the highest and largest function of the field which he serves, and then to strive in every legitimate way to promote that function.

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BRICK and CLAY RECORD

A Semi-Monthly Record of the World's Progress in Clay-working

Published on the First and Third Tuesdays in Each Month by the

Kenfield-Leach Company

445 Plymouth Court, Chicago

Cable Address
Kenleaco, Chicago

Telephone
Harrison 951

Chicago, February 1, 1916

Vol. XLVIII No. 3

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Entered as Second Class Matter January 2, 1911, at the Postoffice at Chicago, Ill. Under the Act of March 3, 1879

Terms of Subscription:
One Year, (24 Numbers)
U. S. . $2.00
Foreign 3.00

All Subscriptions Begin With the Number Last Issued When Subscription Is Received

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The EDITOR'S CORNER

Comment, Criticism and Advice on Live Issues Affecting the Manufacture, Marketing and Manifold Uses of Burned Clay Products

THERE ARE TWO kinds of competition. One comes from the men who are making the same kind of material as that which you are producing and the other from the men who make something which, being offered for the same purpose as yours, either takes business away from you or causes you to make a lower price than you would have made were any or all of these other materials out of the market.

The object of association work is to make competition less burdensome. This is accomplished—or attempted—in many ways. It is also taken up under many different names.

But the object is nearly always the same—the betterment of trade conditions in one industry, thru the elimination of at least a part of the competition which affects it. This, whether the competition is from within or from without.

Cost-accounting is urged on the ground that, when a manufacturer *knows* how much his product is costing him, he will not quote anything but a profitable price.

Publicity is urged on the ground that it will create a greater demand for the product that it advertises and so "steady" the price of that material.

Co-operative action in the matter of freight rates is urged to equalize, so far as possible, the handicap that comes to every industry which has a low-cost-per-ton product, and consequently a low-price-per-ton material.

Associations working on the "Open Price Policy"—and there are such—frankly attempt to equalize the selling prices by reporting past transactions. The object is to eliminate competition among themselves.

Systems of recording the amount of material on hand and unsold at given periods, have for their main object the prevention of over-stocking with the inevitable price-cutting that follows a crowded shed and a sluggish market.

Even the most inactive of associations—those that claim nothing beyond the virtue of affording a time and place for men in the same line of business to "get together and discuss manufacturing problems"—do their part in easing the burden of competition.

For these "get together" meetings pave the way to a better understanding and as they become more and more frequent, and as the attendance grows with the years, there is less talk of someone's putting someone else out of business.

For this last—this "putting someone out of business"—is competition raised to the 'nth power. In every price-cutting campaign there is a fixed mark or destination—a time when prices will "come back" to the point where there is some profit in doing business.

And that time is always when someone — never the speaker — is "down and out."

So it may be said, with truth, that so long as an industry has the good sense to support association work, no "price-cutting campaigns" will start. And for this reason, if none other, associations among manufacturers of clay products are worth all of the time they take and all of the money they cost.

Competition from Within

THE COMPETITION that comes from within—that is the competition of men engaged in manufacturing the same kind of material as that which you are producing—will continue to be burdensome so long as the production is as great, or greater, than the amount which the market will take.

The work that is done by associations among clay products manufacturers is smoothing out, here and there, the rougher points of this competition, but prices will advance with demand—and drop when demand ceases.

In the meantime, the producing power of every branch of the clayworking industry is being increased. And this very vital point seemingly is being overlooked in much of the work that has been done by these associations during the past year.

The law of supply and demand as a price controlling factor has been given too little attention.

The aim of association work has been good—the target wrong. The competition from within has been prodded and punched and pilloried while the competition from without has been ignored—or if noticed, made the object of lamentation but not of attack.

It is time that more attention was given to the things that are limiting the amount of business it is possible for you to secure.

Competition from Without

IN ORDER that you may effectually fight *for* something, it is essential that you have something to fight *against*.

If clay products manufacturers are to fight for a greater demand—and a consequent better price condition—it is essential that they be brought face to face with what is retarding the growth of the demand they are fighting for.

In the case of the drain-tile manufacturer, it is the continued use of cement drain-tile.

The sewer-pipe manufacturer loses business to cast-iron pipe and to cement.

The manufacturer of silo-block has to meet the prices and the activities of the wood stave silo and of the silo built of concrete.

The paving brick manufacturer has arrayed against him the promoters of asphalt, of creosoted block and cement pavements in several forms.

The brickmaker and the hollow-tile manufacturer suffer from the competition of reinforced concrete and from the hewers of timber, the lumber mills and the carpenter-builder.

This competition is, in every instance, infinitely more severe and so relatively more important than the competition of tile with tile, clay pipe with clay pipe, silo-block with silo-block, paving-brick with paving-brick or brick with hollow-tile and *vice-versa*.

What Advertising is Doing

WILL ADVERTISING meet and defeat these outside forms of competition. Assuredly yes, if that advertising takes a form as aggressive as that which has marked the advertising of these competing materials.

But it will be of little use if it is done spasmodically or individually. That is proved by the fact that cement advertising is largely community advertising, as is also the advertising of cypress and yellow pine and a host of other building materials—all of which are retarding the growth of demand for burned clay products.

The greatest business rival of paving-brick is the cement-paved highway. What has made it so formidable? Advertising and organized promotion.

The worst competitor that building brick has at the present time, is cheap wooden construction. What is making it so potent?

Here, it may be said, is an exception. Added to the organized advertising of one and another kind of wood, is the individual advertising of firms making a specialty of "ready-made" wooden houses.

The "Saturday Evening Post" of January 30, 1915, carried a two page advertisement of the North American Construction Company, the makers of "Aladdin" houses. The April 3, 1915, issue of the same magazine carried another full page advertisement of the same company. On June 5, 1915, another full page advertisement appeared, of which more is said on another page of this issue of "Brick and Clay Record." And just as we go to press—the January 29, 1916, issue of "Saturday Evening Post" carried another two-page advertisement for the same concern. These advertisements represent an expenditure of Thirty Thousand Dollars.

And this amount represents only the money spent in the advertising pages of one magazine. To pursue the investigation thru all of the other publications would probably develop an expenditure of not less than One Hundred Thousand dollars.

It has appeared, as will be seen, at intervals; this indicates that the early advertising was profitable.

It could be profitable only as it sold immense quantities of frame houses and considering the fact that the amount charged for each of these is comparatively small, the unit profit cannot be large.

That there are so many of these units, however, as to warrant the expenditure of such an immense amount of money for their further exploitation, gives some idea of the growth of the demand.

Creating a Demand

Every one of these houses—hundreds of thousands—has been erected on a piece of ground that should have been the site for a house of brick or of hollow tile.

Waiting until they burn or rot or blow away is waiting a long while to sell a better material.

The North American Construction Company—its advertisements say "Home Builders to the Nation"—is *creating* a demand. It does not wait until a "good building year" makes all of the lumber yards short of material in order that it may have its share of the better price market.

And in making this demand for "Aladdin" houses it cuts down the demand for houses built of burned clay.

Building Increases

The amount of building done in this country is increasing, year by year. Some years show more—some less—than the year preceding. But averaging, there is a steady increase.

If the entire increase in building were reflected in an increased demand for brick and hollow-tile, all would be well and clayworkers would be justified in extending their plants and increasing their capacity.

Government statistics tell us that this steady increase in building is *not* reflected in a steady increase in the use of burned clay products—at least not in such of these as enter into building construction.

It looks very much as tho the increase was mostly going into frame with a little here and there, to cement.

The Present Year

The decrease in building has been so marked during the past two years and the sudden access of wealth so marked during the past two or three months that Nineteen Sixteen cannot help but be a big building year.

The improvements and additions that have been made to clayworking plants have not been so great but it is safe to predict that everything now in stock and everything that will be made during the present year will be called for and at a satisfactory price.

It may be that thru lack of structural steel and perhaps a labor shortage, a great part of the building which is projected will not be completed and, consequently, we can look with considerable confidence upon an additional "big building year" in Nineteen Seventeen.

By that time, however, the capacity of clayworking plants producing burned clay building materials will have caught up to the demand and unless something is done to off-set the efforts that are being made *by the competition of materials that displace burned clay in building construction,* the production of Nineteen Eighteen will be very much greater than the market will take.

Cement and Cast Iron

Within the past month "The Cement Association" of Philadelphia has started to buy Five-Thousand-Dollar-a-page space in weekly magazines and cast-iron pipe has taken a double-page spread in at least one of the plumbing journals.

These are truly "straws that show how the wind blows." If this advertising be successful—and there is no reason to believe otherwise—more advertising will follow.

Advertising campaigns are not prepared over night.

For more than a year plans have been made for the accumulation of funds necessary to carry on a war of invasion. What this campaign has done to burned clay is shown in the decreased production of many brickyards and in the low prices that have prevailed all during the past year.

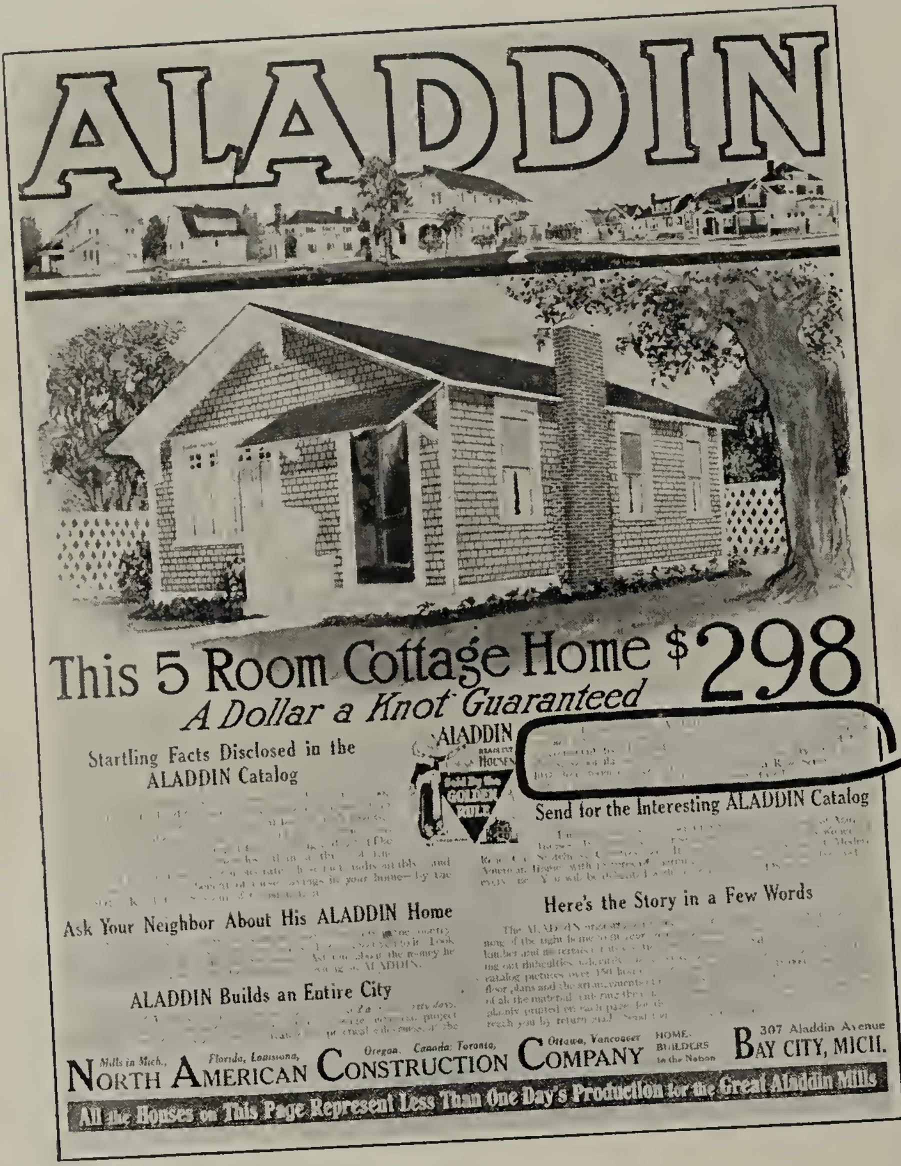
What effect it will have upon the future of clay products depends a great deal upon the men who are engaged in burning mud.

The building of the nation—the housing of its people—its too rich a prize to be allowed to wend its way unmolested, and choose its materials as it sees fit. Popular demand will be forced. one way or the other, as the men who wish to capture it, drive it.

What part in this driving will the brickmaker have—the maker of hollow-tile?

The ADVERTISEMENT

"Whether It Be an Entire City or a Single Little Four Room Cottage, Aladdin's Golden Rule Service Never Fails to Bring Satisfaction and Happiness"



ALADDIN

This 5 Room Cottage Home $298

A Dollar a Knot Guaranteed

Startling Facts Disclosed in the ALADDIN Catalog

Send for the Interesting ALADDIN Catalog

Ask Your Neighbor About His ALADDIN Home

Here's the Story in a Few Words

ALADDIN Builds an Entire City

NORTH AMERICAN CONSTRUCTION COMPANY

Mills in Mich., Florida, Louisiana, Oregon. Canada: Toronto, Ottawa, Vancouver

HOME BUILDERS to the Nation

307 Aladdin Avenue BAY CITY, MICH.

All the Houses on This Page Represent Less Than One Day's Production for the Great Aladdin Mills

This Advertisement, Occupying an Entire Page, Appeared in the June 5, 1915, Issue of the "Saturday Evening Post"

source of its raw material. ALADDIN was called in, took the job and *finished it fifteen days ahead of schedule.* Hopewell, Virginia, stands as a monument to ALADDIN'S unlimited capacity—a city of two thousand population. And, whether it be an entire city, or a single little four room cottage, ALADDIN'S Golden Rule Service never fails to bring satisfaction and happiness out of each transaction.

FOR MORE THAN TWO YEARS, the Press (with a capital P—please) of America, has been cleaning house. The whiskey advertisement, the quack doctor, the patent medicine, doubtful land schemes, "get-rich-quick" mining propositions—all these have been banished to the outer darkness of papers with uncertain circulations and doubtful *clientele.*

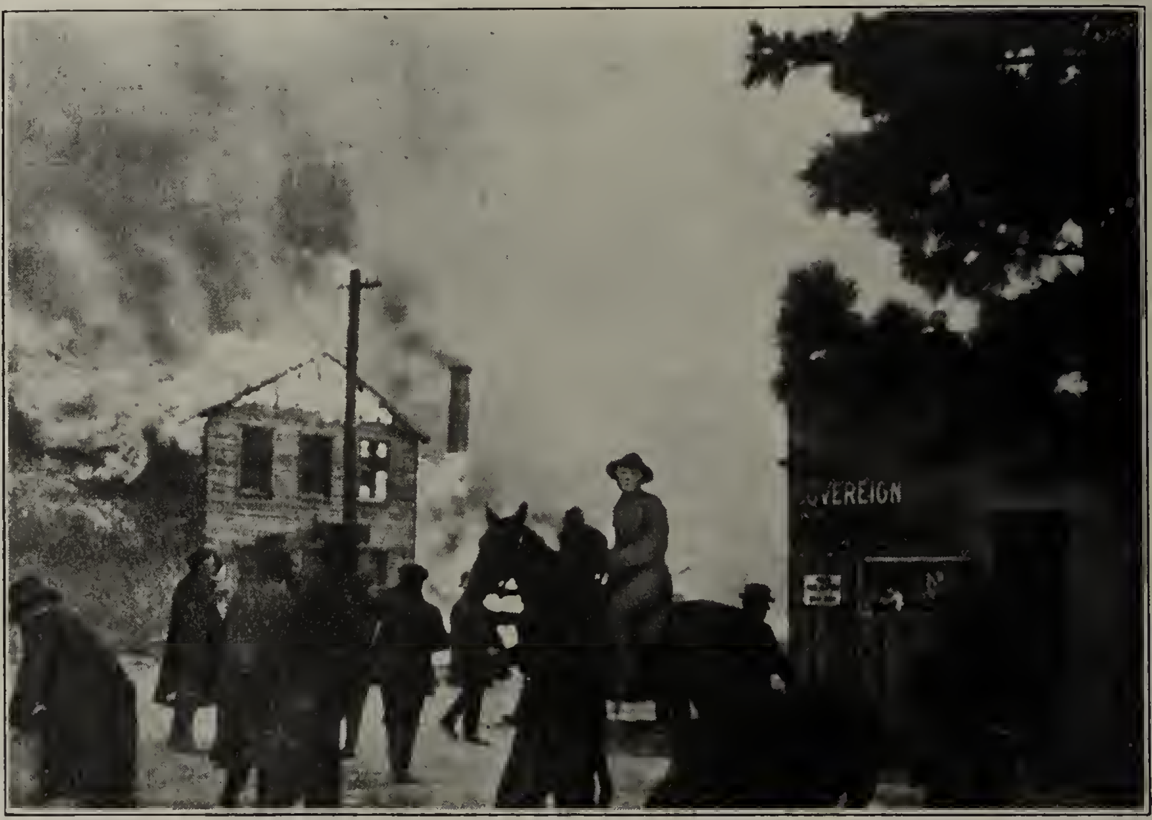
It is time, therefore, since the men behind the power that drives the rotary presses have come to see the advisability of denying the food of publicity to those who would endanger the health—physical and financial—of the great American public, to sound a note of warning in connection with one kind of advertising which is still received with open hearted welcome by some of the magazines whose names are as well known as are the names of our principal cities.

This advertising is a menace to the country's prosperity. That it can afford to buy its way into the immense circulation of such magazines as the "Saturday Evening Post" speaks volumes for the foolhardiness of the American builder. Were he not a good customer, and unless there were hundreds of thousands like him, and equally careless of their lives (and of their neighbors' lives) advertising at $5,000 a page would not be profitable.

When, added to this advertising, the reading columns of a magazine with a circulation of two and a half millions prints a story of how a town was built almost over night, with wooden houses of so flimsy a character as to be "portable"—prints this story without one word of the warning that would naturally suggest itself to the thinking mind, it is also time that the house-cleaning process was allowed to spread to the editorial department, if not for economic, then for humanitarian reasons.

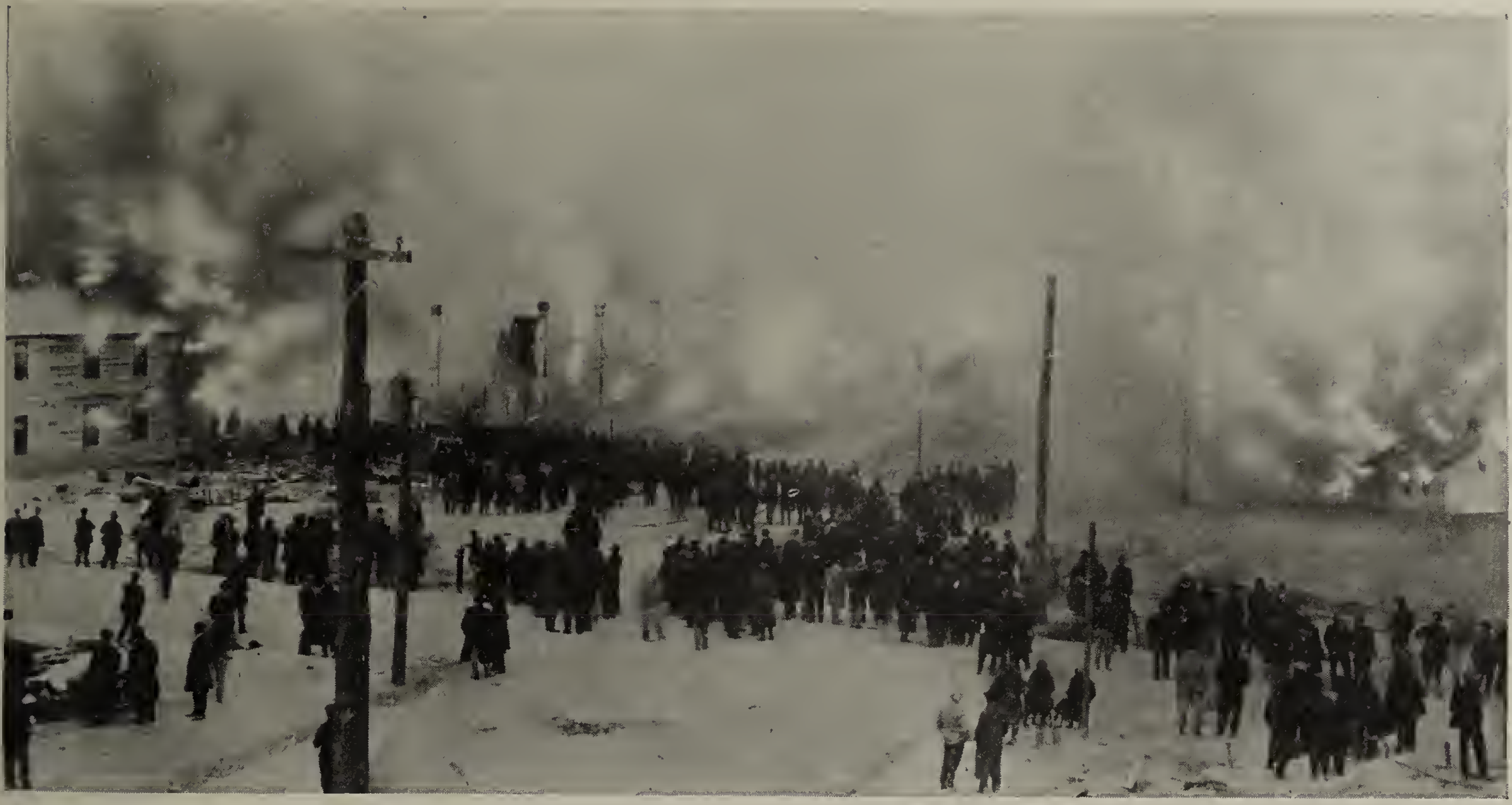
The advertisement that is reproduced says that Hopewell, Virginia, "stand a monument." Two of the other illustrations show how much of that "monument" stood a few hours after a fire had started in a three-story frame building, occupied as a restaurant.

"Eight months ago, there was no Hopewell—just a fragrant pine woods; today a town of twenty thousand—forty thousand expected by December," wrote Reginald Earle Looker in the "Saturday Evening Post" for October 2.



Hopewell, Va., Six Months and Four Days Later

that WENT WRONG



"More Than Four Hundred Buildings, Including Nearly All of the Business Houses of Hopewell, Were Destroyed. Ten Thousand People Are Homeless"

"There is a Midway, extending a mile and a quarter along the railroad siding, a triple row of shanties, tents, galvanized iron sheds, shacks. A year ago it was a flag station on a siding, built especially for a small gun-cotton plant on the Petersburg-City Point branch of the Norfolk and Western.

"Eight months ago a second munitions plant was built, a third is now under construction. An eight-foot barbed wire barricade is strung around the property and guards with revolvers and riot sticks are stationed at the gates. The powder plant within the inclosure works day and night, seven days a week, in three eight-hour shifts, making gun-cotton. There are continuously sevteen thousand men on the fluctuating pay roll.

"Every man is searched for matches on entering the gates. An Italian was discharged—the penalty for a second offense—because he held a match in his hand. 'I picca ma teeth!' was his explanation, but it did not go.

"Every day and all through the night the powder plant throbs with activity. It glows against the clouds for miles like a forest fire. Above the tree-tops twenty stacks throw long trains of smoke across the James. A cloud of sulphur fume from the acid stacks blends with the yellow nitric, rises slowly, hangs in the air, slides down and spreads into the woods of the Hopewell clearing. It sifts through the pine boughs in delicate, blighting tendrils and fragile, noisome wreaths and slinks into the underbrush like the reek from a hell pit.

"It enshrouds everything with a fine yellow film. Now and again pushed by a breath of clean air, the pungent fragrance of the aromatic pines sweeps off the fumes and sends them swirling back in whirlpools among the branches, to and fro, like clouds of battle."

Quoting from a newspaper report, published December 10 —two months later:

"Hopewell, Va., the mushroom city of 25,000 persons, which was built up around the new explosive plant of the Du Pont Powder Company, near City Point, was nearly wiped out by fire yesterday.

"The huge munition plant was saved, but more than four hundred buildings, including nearly all of the business houses of Hopewell, were destroyed. Two banks and all of the hotels were burned.

13

THE SATURDAY EVENING POST

Powdertown—By Reginald Earle Looker

Eight Months Ago There Was No Hopewell—Just a Fragrant Pine Woods; To-day it is a Town of Twenty Thousand

The Story Which Told of Hopewell, Virginia—the City That Belied Its Name

"Ten thousand persons are homeless, and many were brought to Petersburg and Richmond on special trains.

"The property loss is estimated at from $1,000,000 to $3,000,000. Seven companies of state troops have been rushed to Hopewell to preserve order, but before their arrival a negro who was caught trying to loot a burning store had been lynched.

"More than a hundred arrests have been made since the troops arrived. Petersburg itself had to be placed under martial law because of the great number of refugees flocking in. A local militia company was placed in the downtown section of Petersburg and all saloons were closed at seven o'clock.

"Most of the buildings were light wooden structures and the fire swept over them quickly, driven by the high wind. *The arrival of additional apparatus and firemen from Petersburg and Richmond did not appear to check the spread of the flames* and when the fire reached the railroad and telegraph station, hopes of saving the town were practically abandoned."

Hopewell, you see, was a "monument."

The advertisement that was published in the June 5, 1915, issue of the "Saturday Evening Post" said that Hopewell was a monument to "Aladdin" capacity—a capacity that could build a city which fairly clamored for an opportunity to become as infamous as Salem. Or it may be, that in the minds of the men who wrote that advertisement, Hopewell was a monument to Aladdin's "Golden Rule Service"—a service that "never fails to bring satisfaction and happiness out of each transaction."

It stood—a monument to something—for six months and four days after that advertisement appeared and then—what?

It became over night a monument to the ghoulish glee with which the free and untrammeled American citizen will build to burn, if there be no building codes or other legal restrictions.

Hopewell, Virginia, was a city built very much in the same way as the old mining camps were built—and as lawlessly. Brick and cement were too expensive—building fire-safe was too slow. The demands of an embattled civilization across the water made it necessary that thousands of men be brought almost instantly and to a place where there was no shelter.

Life is cheap in Europe—it is almost as cheap in America. Haste, haste, haste was the power behind the building of Hopewell. Haste, haste, haste, was the word written in letters of red and black by the flames of burning Powdertown.

Some day, when more than a certain number of families are to be housed within a certain distance of each other, and where no building code applies, this great government of ours will apply a national code. First, of course, it will have to have some kind of a code that will apply to its own lands—lands beyond state and city control, and exclusively the property of the United States. Here it houses its Army in brick barracks and more than frequently puts its officers in frame dwellings—but that is something else to consider.

Some day, too, the newspapers will stop printing "Fully Covered by Insurance" in connection with fire-losses.

And some day—very much later—magazines will refuse advertising that is so out of tune with correct economics as to boast of a city of flimsy, frail and fire-inviting frame construction—a city that would succumb to a much-to-be-be-expected conflagration, and in a few hours—this despite the combined efforts of two city fire-departments, in addition to its own.

MOBILIZING *the* ARMY *of* CLAY

National Brick Manufacturers' Association Prepares for Big Annual Convention. American Ceramic Society to Hold Annual Meeting and Election of Officers

Cleveland, Ohio — America's "Sixth City"—will soon be the scene of one of the greatest gatherings of men interested in fire-safe building construction that the country has ever seen. The stage is set and the gathering of the clans will begin February 16th, the day scheduled for the opening of the first "Complete Building Show" ever held on this side of the Atlantic Ocean.

For ten days, home-builders will have an opportunity of studying the various methods of construction. Side by side, demonstrations of lumber, cement, brick and hollow building tile will tell, conclusively, which is the more economical—not only in first cost, but in durability.

During the time set for the Complete Building Show, the "big" clayworking convention—the annual meeting of the National Brick Manufacturers' Association — will be in session. Unless precedent be upset, Charles J. Deckman, of Cleveland, Ohio, will be elected to the presidency, Fritz Salmen, of Slidell, La., will be made heir-apparent and George H. Clippert, of Detroit, Mich., advanced to the second vice-presidency. A new third vice-president will be selected, and so started up the ladder that will lead to the presidency in 1919.

Announcement has been made of the papers that will be presented, and which will be as follows:

"Old Versus New Methods of Trucking Brick" (Illustrated)—Lemon Parker, St. Louis, Mo.

"Recent Progress Toward the Standardization of Building Brick"—Edward Orton, Columbus, Ohio.

"The Commercial Side of the Brick Business"—L. K. Brown, Zanesville, Ohio.

"The Use of Clay Products for Farm Buildings in Iowa" (Illustrated)—Homer F. Staley, Ames, Iowa.

"Efficiency Engineering for Brick Plants" (Illustrated)—E. C. Hillery, Raleigh, N. C.

"Clay Testing" (Illustrated)—H. B. Henderson, Columbus, Ohio.

"What's the Matter with the Brick Business" (Illustrated)—Wm. B. Wreford, Detroit, Mich.

"Elements of Cost in Brickmaking" (Illustrated)—R. D. Herbert, Nashville, Tenn.

"Insurance for Brick Plants"—Hubert Somers, Atlantic City, N. J.

"Transverse Tests of Brick in Relation to Strength of Piers" (Illustrated)—J. G. Bragg, Pittsburgh, Pa.

"Progress and Prosperity"—F. W. Fitzpatrick, Wash-

(*Continued on page* 254)

Coming Conventions

Feb. 3 and 4........Iowa State Clay Products Mfrs. Association........Iowa State College, Ames, Iowa.

Feb. 8, 9, 10........Illinois Clay Products Association........Hotel Jefferson, Peoria, Ill.

Feb. 9 and 10........Oregon Clayworkers' Association........Hotel Albany, Albany, Ore.

Feb. 17, 18, 19........National Builders' Supply Association........Hotel Statler, Cleveland, Ohio.

Feb. 21 to 23........American Ceramic Society, Cleveland, Ohio.

Feb. 23 to 25........National Brick Manufacturers' Association........Hotel Statler, Cleveland, Ohio.

Feb. 22 to 25........American Road Builders' Assn........Pittsburgh, Pa.

Feb. 23 and 24........Western Ontario Clay Workers' Association........London, Ont.

The COST *of* BURNING BRICK *in* SCOVE KILNS

An Authoritative Article on the Costs That Are Compelling Brick Manufacturers in the Hudson River District to Seek a More Economical Method of Burning Common Brick for the New York Market

By Allen E. Beals

ALTHO there is a capacity of twelve hundred million common-brick per year in what is known as the Hudson River district (the 1912 production, according to government reports being 1,233,187,000 and 1913 production 1,025,308,000) the production cost per thousand is much greater than that of many plants in the Middle West and West. The greatest difference is in the cost of burning, and it is believed that the day when the permanent kiln will supplant the out-of-date scove kiln is not very far off.

The field for artificial drying is great. Here the nature of the clay offers a problem—one, by the way, that will mean a fortune to the man or men who successfully solve it.

What other economies will be effected is hard to say. Stiff-mud machinery is unlikely, again from the very nature of the material that is used in making the brick, but it has been a mooted question for more than a quarter-century, why the scove kiln, with its tremendous inefficiency, should have endured with hardly a break-down, up to the present time.

The constancy in the character of the clays of the Hudson valley, from Haverstraw to Albany, N. Y., is remarkable. There is the same general type of marly clay of a blue-gray color, except where the upper beds have weathered, in which case the color is yellow, owing to the presence of limonite. Mixed with water, they are by no means highly plastic, but behave very much like feldspar. The method of drying is almost entirely "open-yard."

For years, the cost of brick production in the Hudson River district remained almost stationary. Fifteen years ago, it ran between $4.90 and $5.10 per M., which included a towage cost of $1.25 and a commission of 25c per M., making a net cost of from $3.40 to $3.60; at that time, the cost of manufacture in the New Jersey yards employing the old hand-method was between $3.60 and $3.90. One soft-mud plant operating on Long Island at about the same time, had a yard cost of $3.00.

Today, with the higher cost of fuel, the greater difficulty in getting clay from the banks and benches to the pugs, the increased cost of common and skilled labor, the heavier depreciation incident to the continued use of old machinery, the cost to Hudson River brick manufacturers to put a thousand brick into New York City is between $6.00 and $6.25 per M., partially on account of the increased towing rates and higher selling commission, but largely on account of increased operating expenses, especially labor cost.

A Typical Hudson River Common Brick Plant

It is common knowledge that the initial investment in a soft-mud brick plant is smaller than is required for a plant of any other type, but that a larger force of labor is required than in the stiff-mud or dry-clay process yards. It is right here that one of the biggest factors is at work in making for drastic changes in the burning systems in the Hudson River district. On an average, one man is required to every thousand brick made. If the yard has a capacity of more than 50,000 brick a day, this means a minimum of at least fifty men per yard. Each machine requires about twenty-five men in one capacity or another and with five hundred and ten machines in the entire district the maximum labor list runs to 12,750 men.

In recent years the construction of large state and municipal works like the Croton aqueduct and the New York subway systems have taken the labor from the brick yards, altho there has always been a big negro labor market in the south from which the Hudson River manufacturers could draw. But negro labor in brick plants is not altogether satisfactory. Negroes are notoriously slow workers, yet they want the same pay as Italians, Huns and Slavs. This is an issue that precipitated a strike at Haverstraw some months ago.

However, this labor situation, coupled with a recent order by the New York building authorities to the effect that "pale" or underburned brick could not be used any longer in bearing walls or even as filling, threw a great quantity of brick back upon the manufacturers.

In scove kilns, burning 500,000 brick, the "pale" brick development may amount to ten or fifteen per cent, whereas with a permanent kiln this wastage would be less than three per cent,—something between 12,000 and 15,000 brick.

Much of this "pale" brick is ground up and used for tempering clay that is to be used for brickmaking in a subsequent arch, *but the element of waste is there and it is becoming a question of just how long this waste can continue to be figured as an incident instead of as a major leak—a leak that is sapping brickmaking profits.*

The cost of burning brick in the Hudson River kilns, regardless of whether the plant is on the east or west bank or at Haverstraw or Kingston, is practically the same. It does not vary three cents a thousand in the aggregate per year, but in open yard drying there is a wide daily fluctuation. The cost between Hudson river burning and that in, say for instance, the Sayre and Fisher plant at Sayreville, N. J. (sixty-five miles farther south), is considerable, amounting, probably, to six cents per M. brick in favor of the Sayreville plant's scove kilns.

The cost of burning a thousand brick with wood in 1900 was between sixty and seventy cents and with coal, forty and fifty cents. These coal costs are exclusive of the cost of grates. Where oil was used, there was a royalty of $1.60 to be paid on every burner at that time, and only three plants used oil. The cost is said to have been about thirty cents per M. brick, not including the cost of the burner royalty—which brought the actual burning cost up to between thirty-five and thirty-seven cents per thousand.

Today, practically all the plants use coal for burning and the cost is about what wood formerly was—around sixty cents a thousand—while the cost of burning with wood, owing to meagre supply, is reported to be as high as eighty cents. This cost will be much higher next year, in all probability, owing to the advance in coal prices, altho manufacturers are piling coal at present in a lavish manner. This coal is bought in bulk in New York and is taken up to the plants on returning brick barges.

The process of building scove kilns is presented here to show how wasteful is the method as compared with the permanent kiln which requires no daubers or arch men and which so largely cuts down the wastage.

Brick in scove kilns are set up in arches. Several of these, sometimes as many as twenty, go to make up a kiln. The number of brick in an arch varies from 35,000 to 40,000. An arch is about forty courses high and about fifteen arches make up the average kiln.

The open portion of the arch is about fourteen inches high; the brick above the arch are set three one way, and then three on top at right angles. They are kept slightly separated by putting small pieces of clay between them.

The first row of brick on top of the arch is called the "tie-course" and the first fourteen courses, including the "tie course" above the arch, is called the "lower bench," the rest of the courses above the fourteen being called the "upper bench."

When the arch and upper and lower benches have been set, brick are laid flat over the top of the kiln; this is the "raw platting." On top of this are laid burned brick, at right angles to those in the "raw platting"; this latter is known as the "burned platting." Hanging from the roof of the kiln shed at the same level are a number of brick which serve as a height guide.

A wall of "double coaled" brick is put around the outside of the kiln—"scoving the kiln" as it is called—and this is daubed over with mud to prevent any air from entering the kiln, except thru the doors.

These "double coaled" brick have six or seven times as much coal dust in them as the regular brick, the combustion of this coal supplying the amount of heat necessary to warm up the outer portions of the kiln—portions that are not sufficiently heated by the arch fires. These "double coaled" brick are also set at the bottoms of the arches on both sides of the kiln. The doors consist of an iron frame about fourteen inches high, with a sheet-iron plate to close the opening. The frames are set in the courses of "double coaled" brick at the bottom of the arches.

It takes three "setters" and four "wheelers" about one day to set an arch of 40,000 brick; two men will daub the outside of a fifteen arch kiln in one day.

Having walled up the kiln with "double coaled" brick and finished the daubing over, the next step is to start the fires and burn the brick. The principle is essentially the same, whether wood, or coal, or oil is used.

Every alternate brick of the burned platting is stood on end to allow the "water-smoke" or steam to escape as quickly as possible thru the wooden top-boards of the protecting shed. A fire is then started in the mouth of each arch. When coal is used, the fire is started on the windward side of the kiln so as to allow the smoke to blow thru the arches.

The fire is also started from the other end of the arch and the two fires are then built up slowly till they meet in the middle. The time of "crossing" the fires varies: with machine-made brick the fires are not crossed as quickly as with hand-made brick. Along the Hudson the time of crossing is from forty to sixty hours.

The fires are increased until the "water-smoke" changes to a bluish black smoke and at this point the fire can be seen, at night, coming from the top of the kiln. The kiln is now hot and the brick begin to shrink or settle and all the platting is turned down.

Up to this point great care has been used to increase the heat gradually. The brick then get their heaviest heat and the oxides of iron are changed to anhydrous peroxide, giving the brick their red color.

After the firing has been done, the doors are all closed and plastered over to prevent any air entering. The kilns take several days to cool, and, when cool, the brick are put on wheelbarrows and taken to barges or cars and then shipped to market. The time for burning is from five to seven days with wood, four to five days with oil. Coal takes about six days.

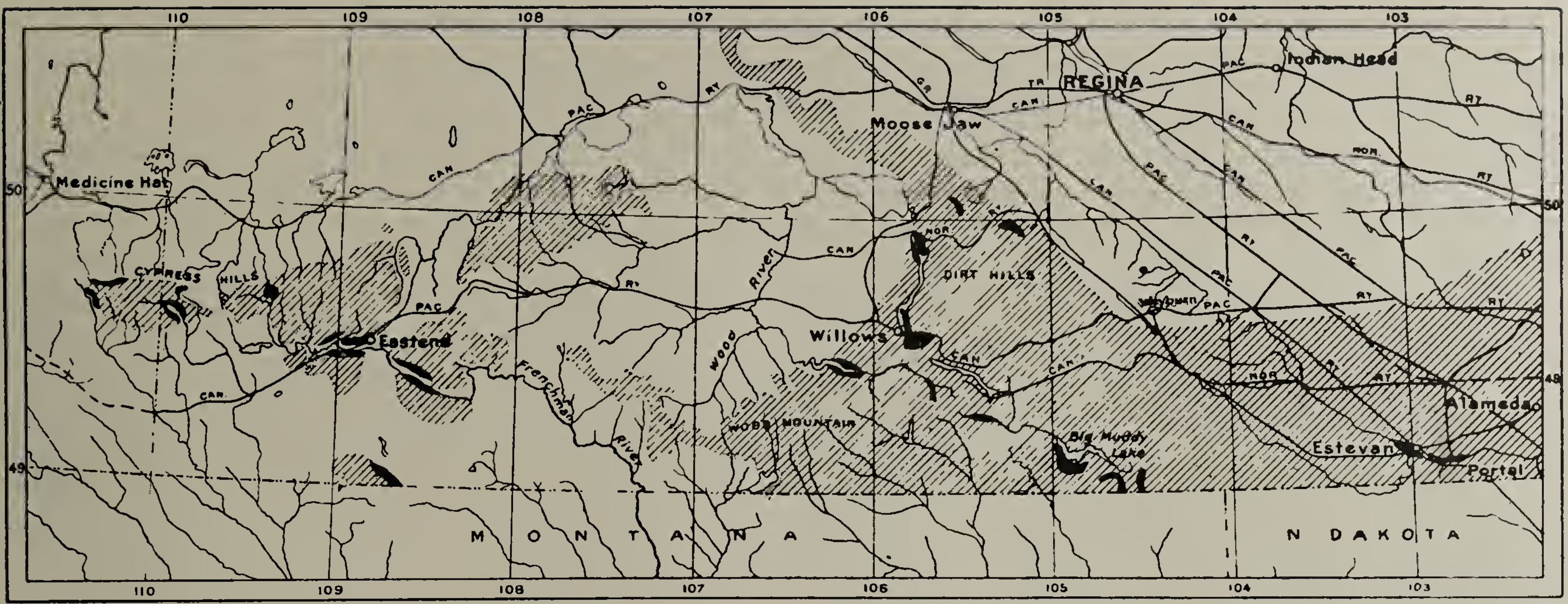
Inventors have been at work on the Hudson River scove-kilns looking toward the perfection of a system that will still make it possible to use scove-kilns and at the same time accomplish the same economies that permanent kilns afford. Tests of various kinds are now being made, which indicates that the manufacturers themselves are coming to the conclusion that in the face of existing competition at New York and the inability to bring prices to a better level there, the only solution to their problem is to cut down manufacturing costs—especially in their kilns.

Uniform Classification on Drain Tile and Sewer Pipe

The Committee on Uniform Classification has made recommendations to the Official, Southern and Western Classification Committees, relating to shipments of drain-tile and sewer-pipe. These recommendations will be docketed and shippers will be given an opportunity of being heard before the recommendations are adopted or rejected.

The recommendations are long and cover a great many very important points. Manufacturers of drain-tile and sewer-pipe will do well to write to the Committee on Uniform Classification, 608 South Dearborn Street, Chicago, Ill., asking for a copy. With this in hand, they will be able to know, in advance of the hearings, whether or not these proposed classification will be to their benefit, or otherwise. This is very important—a thing that should be done *now* and not put off.

No man should be so busy that he has too little time to protect his own interests.



▨ Fort Union Formation
■ Clay outcrops

Index map of Southern Saskatchewan, showing Fort Union Formation and location of important clay outcrops

Figure 1.

Scale: 35 miles to 1 inch

SOUTHERN SASKATCHEWAN

and it's

CLAY DEPOSITS

A Paper Read Before the Canadian National
Clay Products Association's Convention
Held at Toronto, Ont., Jan. 18, 19 and 20, 1916

By N. B. Davis

Clay Technologist, Department of Mines, Ottawa, Ont.

IN the southern part of the Province of Saskatchewan there is located one of the most valuable and extensive clay fields of the Dominion of Canada. From the vicinity of Estevan, westward along the International Boundary, some two hundred and fifty miles, and north to make a triangular area with the apex west of Moose Jaw, the country is underlain by a series of clays, silts, sands and lignites, comprising what is known to geologists as the Fort Union formation. West of this again, smaller detached areas of this same formation outcrop in those elevated areas known as Boundary Plateau, White Mud River Plateau, and the Cypress Hills.

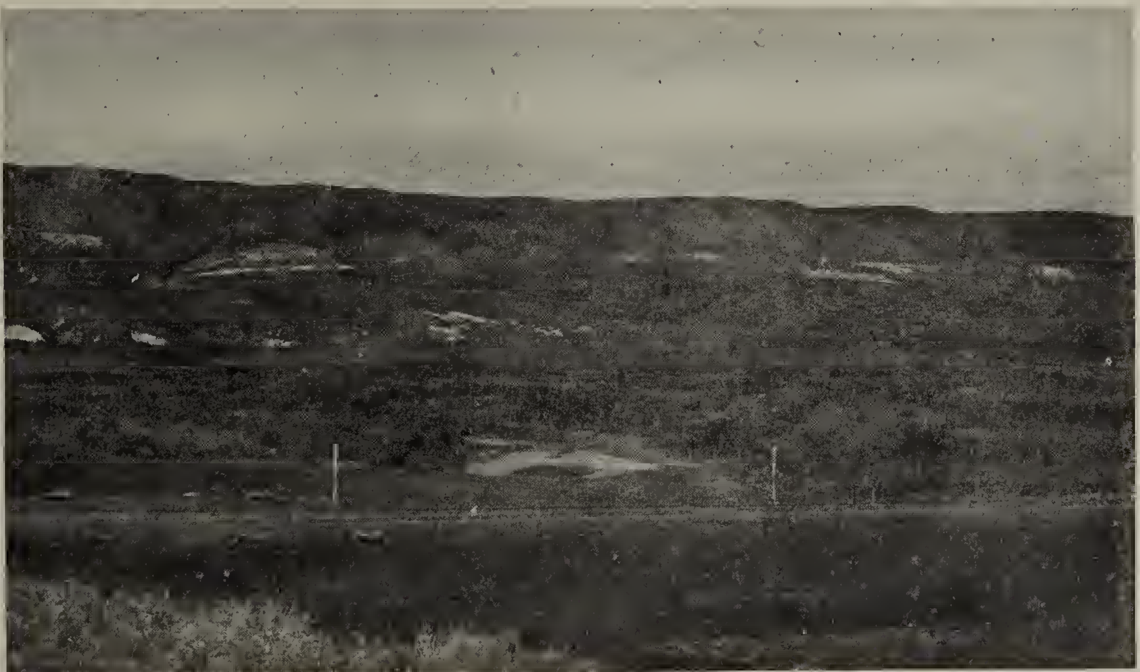


Figure 2. White Clay Outcrop in Valley of White Mud River, Near Ravenscraig, Sask. Canadian Pacific Railroad Track in Foreground.

Altho the Fort Union formation is known to generally underlie these areas, the valuable clays are not everywhere available over them. It is only in the escarpments of the plateaus, and in the large river valleys, with their tributary *coulées*, that good workable sections of the clays are found.

The most important beds of this formation, to the clayworker, are the white and gray refractory clays and clayey sands, constituting what are lo-

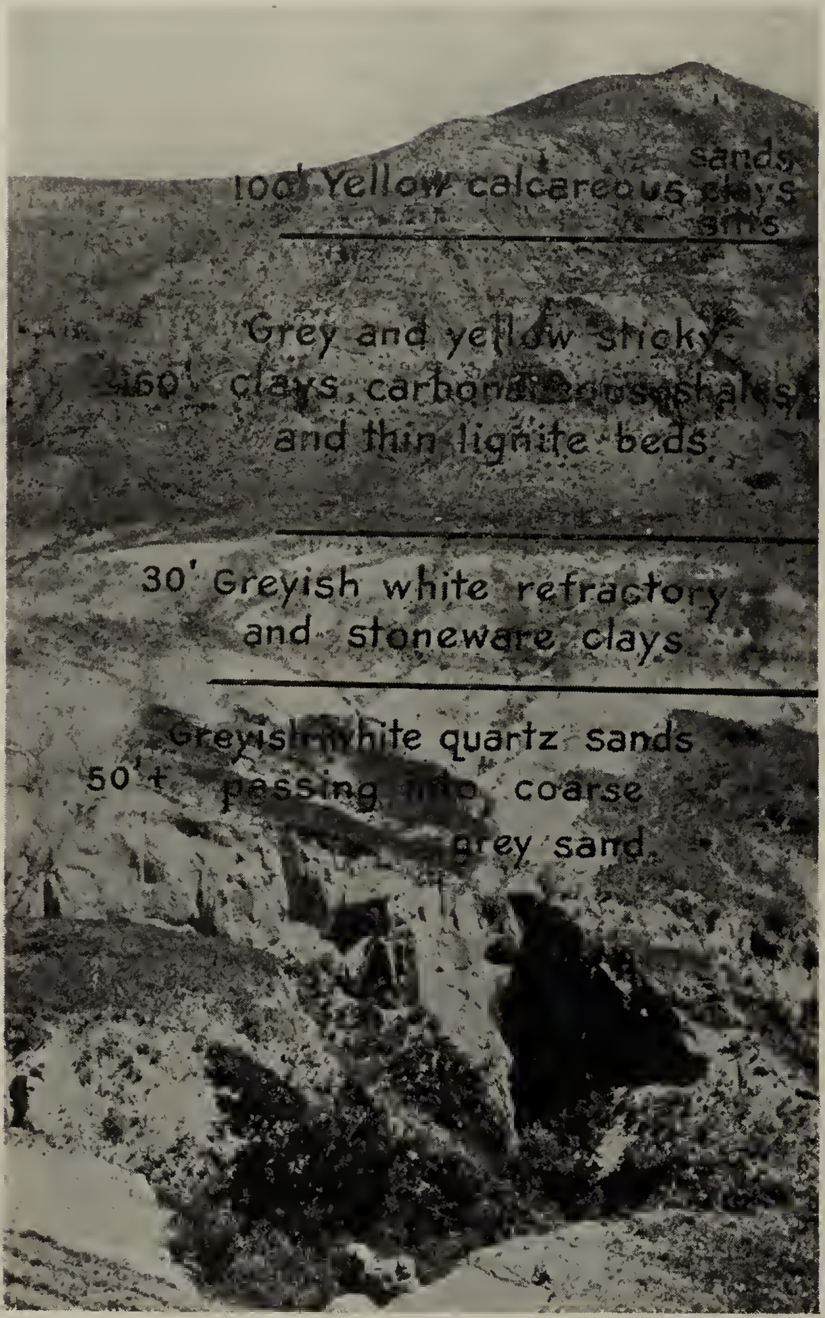

100' Yellow calcareous clays sands silts
Grey and yellow sticky
160' clays, carbonaceous shales and thin lignite beds.
30' Greyish white refractory and stoneware clays.
Greyish white quartz sands
50'+ passing into coarse grey sand.

Figure 3. Section of Fort Union Beds. Frenchman River Valley, Ravenscraig, Sask.

cally known as the "white muds." The white plastic clays are of stoneware character, fusing around cone 15. The more sandy beds are quite refractory, some of them standing up to cone 30.

These refractory clays are followed in importance by yellow calcareous clays and clay silts, which are suitable for common clay wares, such as brick and drain-tile; and for mixing with the stoneware clays to reduce the temperature of vitrification in making sewer-pipe and hollow block.

Dark gray, brown, and black, gumbo-like clays occur in the same formation, but their drying defects are so bad that they cannot be used without special preliminary treatment, such as the preheating practiced at Estevan.

Lignite beds of fair quality are here and there associated with the clays, and their economic aspects are of great importance to the future of the clayworking industry.

The accompanying sketch map (Figure 1), shows the general distribution of the clay-bearing Fort Union formation, the important clay outcrops being suitably indicated.

It will be noticed that the largest area includes the elevations known as Wood Mountain and the Dirt Hills, and in the following notes these localities, along with other prominent topographical features, such as the Big Muddy Vallcy, Souris Valley, and Cypress Hilsl, will be used as headings.

CYPRESS HILLS

The section of clays found in the Cypress Hills is the most complete one in the Province. The hill tops are protected at the highest elevations by quartzite gravel, the pebbles of which should prove of value for grinding purposes. Below the gravel there is a great thickness of fine, plastic, grayish white, to mottled red and green clays. They are best exposed near the western end of the Hills. Some of these are slightly calcareous. Their working qualities are excellent.

The white refractory clays are not exposed here, but, continuing eastward, easily worked outcrops are to be found near old Fort Walsh on Battle Creek, and in the valley of the White Mud or Frenchman River, the most important locality being the last named.

From Palisade to South Fork the Canadia Pacific Railroad follows the deep valley of the Frenchman River and Swift Current Creek *coulée*. For most of this distance, some fifteen miles, the white clays can be seen outcropping in the valley sides within a mile or so each side of the railroad (Figure 2).

A typical section measured in the vicinity of Ravenscraig resulted somewhat as shown in Figure 3.

It will be noted that the white clays are underlain by a considerable thickness of grayish-white quartz sands, which may prove of value for molding or glass making.

The yellowish calcareous clays, silts and sands overlying the white clays are quite thick, but erosion has here and there made the white clays available without underground mining operations being necessary.

The beds are all more or less lenticular, all thru the Fort Union formation; they thicken and thin from place to place. Along the Frenchman River the good clays appear to increase in thickness eastward, while to the west the beds are more sandy.

In the vicinity of the town of Eastend, where the railroad leaves the valley of the Frenchman River, the best workable outcrops are to be found. To the north and south of the town, erosion has bared considerable quantities of the valuable white clays; in one outcrop the following section was measured:

1.	Glacial drift	1 ft. to 10 ft.
2.	Brown clay	8 ft.
3.	Fine yellow sand	2 ft.
4.	Plastic white clay	5 ft.
5.	Purplish gray clay	2 ft.
6.	White plastic clay	6 ft.

The clays below the glacial drift at this point have good working qualities, with shrinkages within practical limits. They burn to dense, grayish bodies at cone 5, and do not soften until the deformation of cone 15. The Albany slip, Bristol and salt glazes have been applied, with success, to these bodies. (See Figure 4.)

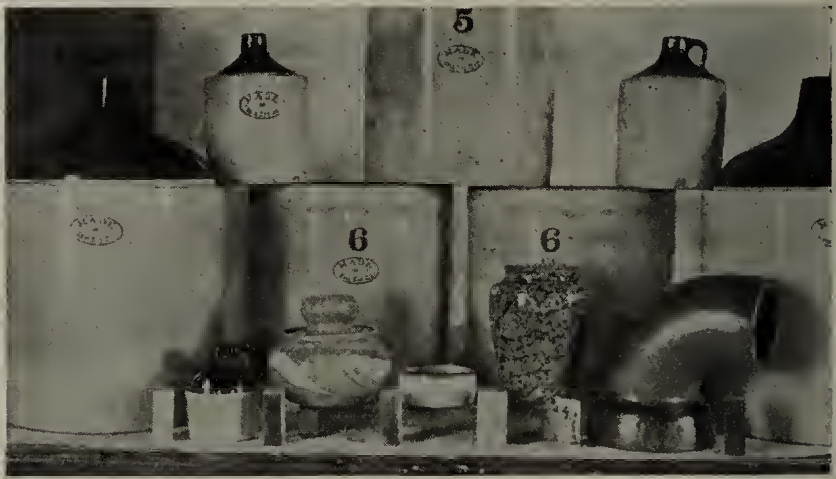


Figure 4. Stoneware Pieces Made From Eastend Clays

The glacial clay silt of the valley bottom near Eastend burns to a fine deep red color at cone 010. A small quantity of sand would have to be added to the clay, however, to dry it without cracking. It could then be used for the manufacture of hollow building block and common-brick.

WOOD MOUNTAIN

Between Eastend vicinity and the northwest slope of Wood Mountain the country is heavily covered by glacial deposits, and the Fort Union clays are hidden.

In the *coulées* tributary to the Wood River and around Twelve Mile Lake the white clays again appear. A sample of a sandy, white clay, collected on the north shore of Twelve Mile Lake, stood up to cone 28.

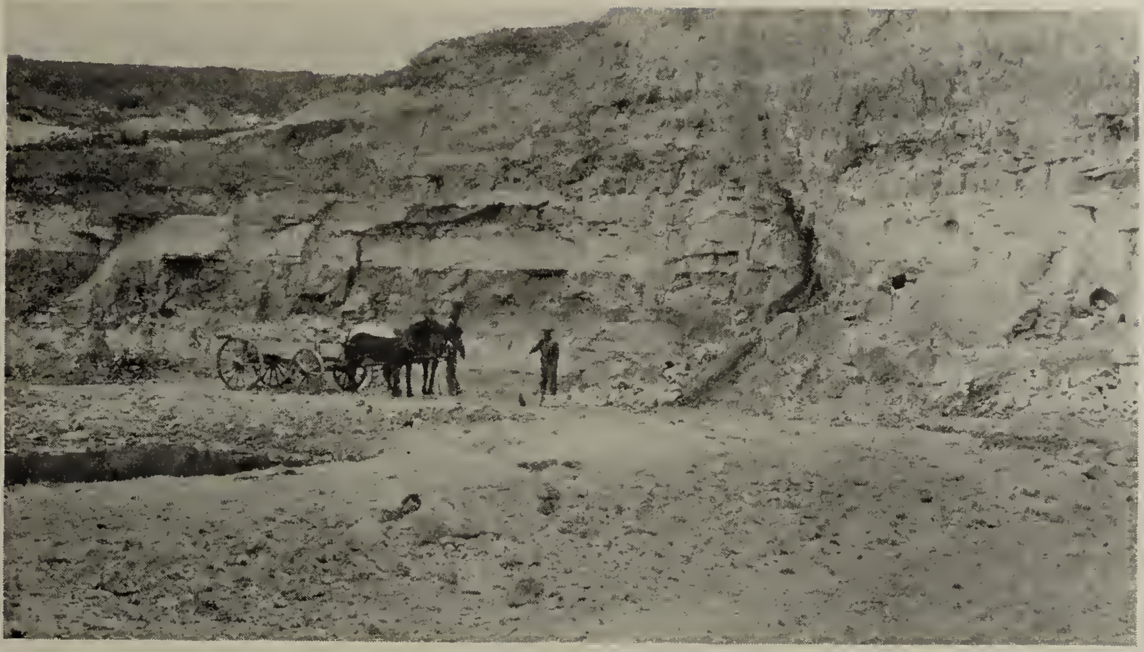


Figure 5. Clay Pit Worked by Alberta Clay Products Company, Near Willows, Sask.

Further northeast, in the Lake-of-the-Rivers valley, near Willows station, on the Canadian Pacific Railway, the Alberta Clay Products Company is working a fine section of the refractory clays, and shipping the sun-of-bank some 450 miles, via Weyburn and Moose Jaw, to Medicine Hat. At this place it is worked into sewer pipe, flue-lining, wall coping, etc. Figure 5 shows the pit being worked during the summer of 1915.

The run-of-bank burns to a dense, vitrified body at cone 9. A sample of a fifteen foot bed in this section reflects the properties of a ball clay.

DIRT HILLS

The white clays appear further north again in the Lake-of-the-Rivers valley, near Mitchellton on the Canadian Northern Railway, and again along the north-facing escarpment of the Dirt Hills. It is here, at a place called Claybank, that the Saskatchewan Clay Products Company is operating the only plant in Saskatchewan using the refractory white clays. (Figure 6.)

The plant consists of the usual pit equipment of cars, hauled by cable, a large storage shed, one dry-pan, one dry-press machine, and eight round, down-draft kilns. Power is supplied by a 150 H.P. Diesel oil engine.

The white, grayish-white and sandy clays are blended to make dry-press face-brick of plain buff and flashed colors.

Mr. George Shoemaker is manager of the plant, and at present is carrying on experimental work with the intention of placing fire-brick on the market, tests on some of the clays having shown them to stand up to cone 30.

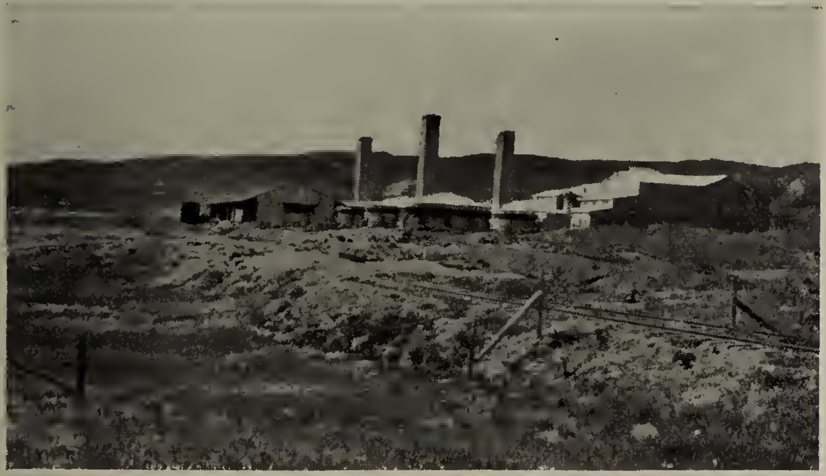


Figure 6. Plant of Saskatchewan Clay Products Company, Claybank, Dirt Hills, Sask.

BIG MUDDY VALLEY

In the Big Muddy Valley, from Willowbunch Lake, southeast to the International Boundary, the white clays outcrop here and there all down the valley. The best exposures are located near the boundary line in the vicinity of Big Muddy postoffice. Tests on a number of samples from this locality show the clays to be in all respects similar to those found in the other areas described.

SOURIS VALLEY

East of the Big Muddy Valley, the white clays are not known to outcrop. The whole thickness of the Fort Union beds consists of dark gray, brown and yellow clays and numerous lignite seams. The best outcrops occur in the Souris valley, and more particularly in the vicinity of Estevan, where numerous plants are working the red and buff burning clays for making common and face-brick, and hollow block. The red burning clay has to be preheated to overcome checking, and is then made into dry-press brick.

The industry is fairly well established in the Estevan field, there being some five plants equipped for operation at the present time.

RAILROADS AND FUEL SUPPLY

Until but recently rail transportation has been lacking to the most valuable clay areas. The Portal-Moose Jaw branch of the Canadian Pacific Railway has served the Estevan field for a number of years, but the important refractory clays do not occur there.

Just two years ago the Canadian Northern Railway completed its Avonlea-Gravelbourg branch as far as Claybank in the Dirt Hills, and made the high-grade clays of this locality available. However, the market for high-class face-brick broke about the time the railroad arrived, and the plant at Claybank suffered accordingly. During the past year the same Canadian Northern Railroad branch has been constructed further west, and made available the clays of the north end of Lake-of-the-Rivers, near Mitchellton.

Three years ago the Canadian Pacific Railway started its Weyburn-Lethbridge line, and since then has tapped the clays of the south end of the Lake-of-the-Rivers and of the Frenchman River valley. The line is now completed as far west as the Alberta boundary, and it is hoped that the time will not be far distant when connection will be made with the construction east from Lethbridge.

South of the Canadian Pacific Railway the Canadian Northern Railway has a branch line extending westward to near the southeast end of Willowbunch Lake. If this line is completed along the proposed route, it will open up the clay and lignite areas immediately to the north of Wood Mountain.

At present most of the fuel used is brought in by rail over the Canadian Pacific Railway from Alberta. It is mostly a semi-bituminous coal, and, because of the long haul, the price is high. In the Estevan field a certain amount of the local lignite is utilized, but its full efficiency is not being realized.

Extensive tests, carried on at the fuel-testing plant of the Department of Mines in Ottawa, have shown the lignites to be ideal for making producer-gas for power generation in a gas-engine. No steaming tests have been made, but the analyses point to its successful application in this way, under suitable mechanical conditions.

The gas-producer has come to the clayworking industry to stay, and the clayworkers of Saskatchewan, and the West generally, should not be slow to adopt it as an economical means of converting a poor fuel to a high-grade one.

Natural gas has not been struck, as yet, in commercial quantities anywhere in the southern part of the Province. Preparations are being made to sink a well at Eastend, in the hope of getting a cheap fuel to aid in the local development of the clays.

THE FUTURE OF THE CLAY INDUSTRY

The importance of the clays of Southern Saskatchewan to the whole Canadian West cannot be overestimated. There is an abundance of high-grade clays suitable for the manufacture of stoneware, Rockingham ware, and white earthenware, as well as for all varieties of burned clay products for structural purposes.

Before the outbreak of the war in Europe the immediate future of the clay industry in Saskatchewan promised well. The railroads were spreading lines of transportation over the country, crops were fair, and the western farmer was beginning to appreciate something better than a sod shack to live in. Lumber had to be hauled great distances, and the price was accordingly high. Prairie fires were teaching the builders with wood the value of more fireproof construction. Altogether, the country was ripe for a better supply of burned clay products.

With the war our needs have not materially changed. Business is simply marking time for a better monetary condition. The country is essentially a farming one, and with wild-boom days over, and the war at an end, normal conditions should soon return.

Intense Patriotism and Military Activity Marks Canadian Clayworkers' Annual Convention

Toronto, the scene of the Canadian National Clay Products Convention, has very much the appearance of an armed camp. Men in khaki are at every hand, and the bands play "God Save the King" many, many times a day. Toronto, it is said, will send ten per cent of her population to the front—and this means one young man out of every ten people, men, women and children.

Business in Toronto is "flat." The bars are closed at eight in the evening—seven o'clock Saturdays. One has to be a burglar to get a drink on Sunday.

Practically every woman is interested in Red Cross work—Canada is fighting. The impression is that those trenches in France and Belgium—in Egypt and Mesopotamia—are Canadian outposts. It isn't "The Empire"—it's the Dominion.

The usual contingent of clay machinery men from the "States" was absent from this year's gathering of the clay clans of Canada. The convention was held at the King George Hotel, in Toronto, Jan. 18, 19 and 20. The 1915 officers were all re-elected, and Hamilton, Ontario, was chosen as the meeting place for 1917. A part promise was given Montreal for 1918.

A visit to Toronto's new technical school was a feature of the first day's session. Here is installed a complete equipment of clayworking machinery, and a kiln is in course of construction.

The evening of the first day was marked by a theatre party, in which those in attendance at the convention were guests of the ever youthful "Dan" Lochrie.

Papers were read by William Burgess, superintendent of the Don Valley Brick Works, Todmorden; J. P. Hynes, a local architect; W. W. Pearse, city architect of Toronto; Joseph Keele, of the Mines Branch, Canadian Geological Survey; A. F. Greaves-Walker, manager of the Sun Brick Company, Ltd., Toronto; Charles A. Millar, inspector of clay products plants under the workmen's compensation act; F. R. McCannell, assistant to the president of the Milton Pressed Brick Company, of Milton, and by N. B. Davis, clay technologist, Mines Branch, Canadian Geological Survey. Another paper, prepared by Ray T. Stull, of the Dunn Wire-Cut-Lug Brick Company, of Conneaut, Ohio, was read in his absence.

A banquet, tendered the members and guests by the "City Fathers" of Toronto, was served at the Prince George Hotel, the evening of the 19th.

Wisconsin Clayworkers Fight Freight Raise

The proposed freight advance on brick, hollow building tile, sewer-pipe and drain-tile formed the main topic of discussion at the two-day session of the Wisconsin Clay Manufacturers' Association, held at the Republican House in Milwaukee, January 27 and 28. A committee was appointed to appear before the State Railway Commission's meeting, which was held in Madison, Wis., January 31.

The 1915 officers, A. W. Hilker, of Racine, president; Oscar Zimbal, of Sheboygan, vice-president; Samuel Weidman, of Madison, secretary, and S. Gunther, of Port Washington, treasurer, were re-elected.

A number of interesting papers were presented to an attendance of about thirty-five, mostly clayworkers operating in Wisconsin.

Matt. King Speaks at Nebraska Convention

Celebrating its first birthday, the Nebraska Brick and Tile Association held a three-day meeting, beginning January 18, at Lincoln. The papers and discussions that featured this convention stamped it as being worthy of a place in the front rank of memorable gatherings of the industry.

While the morning session of the first day—Tuesday, January 18—was taken up by the dispatching of routine business, the convention got down to constructive work in the afternoon, the program for which was supplied by professors from the engineering department of the Nebraska State University. In the evening a meeting was held at which Matt L. King, secretary of the Permanent Buildings Society, gave an illustrated lecture on the use of clay products in farm buildings.

At Wednesday morning's session a paper was read by

(Continued on page 254)

MAKING SILICA BRICK *for* BY-PRODUCT COKE OVENS

A Paper Read Before the San Francisco Meeting of the American Institute of Mining Engineers, September, 1915

By Kenneth Seaver, B. S.

(*Asst. Genl. Sales Mngr., Harbison-Walker Refractories Co.*)

IT IS rather gratifying that in the field of the manufacturer of refractories, in which, as a whole, foreign practice has surpassed us, the United States stands pre-eminent in the making of silica brick. In some instances European manufacturers have refused point-blank to credit the possibility of making to such specifications as are common with us, until the actual completed shapes were shipped for inspection. But both the manufacturer and consumer in foreign lands are now frankly learning from us and benefiting by our advanced practice in this field, as is evidenced by the orders placed here and the efforts put forth abroad to come up to the standard of American-made material.

In no metallurgical operation has the employment of silica brick spread with such leaps and bounds as in the building of plants for the carbonization of coal, particularly in the by-product coke oven. To-day, in practically all types of oven, the structure above the floor level, (except the facings) is of silica, while in the recuperative and in some regenerative types, its use is extended to that portion of the oven below the floor as well.

By reason of the fact that there are a number of classes of refractories of higher silica content than the usual so-called fire-clay brick, there is sometimes a misunderstanding as to the class of material referred to as "silica" brick. We here refer only to a brick having a silica content of 94 per cent or more and made usually from quartzite rock with a small percentage of lime as a binder. The term "silica" brick is sometimes rather loosely applied to brick from highly siliceous clays, or to a quartzite refractory of mingled fire-clay and quartz rock; but such products are not considered in this discussion.

Materials

The rock from which practically all high-grade silica brick are made is a true quartzite or metamorphosed sandstone, variously known as ganister, quartz, quartzite, sandstone, silica rock, etc.—the fields of major importance being, in the order of their relative importance, those of Pennsylvania, Wisconsin, Alabama and Colorado.

PENNSYLVANIA QUARTZITE

Pennsylvania probably manufacturers from 75 to 85 per cent of all the silica brick made in the United States, almost entirely from the quartzite found in the Medina and Oneida formation. While this formation extends across the State of Pennsylvania reaching into New York State on the north, and Maryland, Virginia and still farther toward the South. the quarries are practically all in Huntingdon and Blair counties, Pennsylvania. It is in this restricted area that the quartzite is at its best. Toward the north and toward the south it becomes softer, is no longer a true quartzite, or is too much impregnated with iron. The rock is also comparatively easily accessible in the counties mentioned, enormous quantities lying loose upon the surface. The particular occurrence of this loose rock has here been brought about by the Juniata River and its tributaries, as they have cut across the formation, wearing away the softer formations beneath, and leaving the Medina overhanging and exposed. In the course of time it has been weathered and broken up by the elements into the bodies of loose rock or "floes," as they are called, which may cover an area of a thousand acres or more. The depth usually varies from three or four to as much as 20 ft. Smaller floes formed in the same way may be found along the flanks of the mountains; but they nowhere compare in size with those formed where the measures have been cut transversely.

This rock is sometimes quarried out of the solid measures; but by far the largest amount used is that taken from the bodies of loose rock, as the latter is not only cheaper to work but is of more uniform quality. The white Medina formation is not composed entirely of quartzite, but is made up principally of sandstone with intermingled strata of quartzite. Thus where the formation has been broken up, the softer sandstones unsuitable for the manufacture of silica brick have tended to weather away and disintegrate, and have left the larger portion of the floes to consist of quartzite. When standstone is mixed with the quartzite in the floes it is readily detected by its appearance, as it tends to become much more rounded and worn in weathering than does the quartzite, which maintains its sharp, angular edges.

The individual pieces in these floes range in size from those of fist-size to boulders weighing many tons. Probably 50 per cent of the rock occurs in pieces weighing more than 500 lbs. The largest floes are found at the gorges of the Juniata River near the towns of Mount Union, Mapleton, Point View, Lewiston, etc.

It is interesting to note that the Oriskany sandstone, extensively used as glass sand, is found in close proximity to the Medina and that although exceedingly pure in its composition, its softness renders it unsuitable for high-grade silica brick. It consists of a mass of minute quartz grains loosely held together, and often so friable that it can be easily worn away by the hands. On the other hand, the Medina quartzite consists of quartz crystals cemented in a mixture of the same composition and of equal hardness with the crystals. The difference in the two types of rock when ground to sufficient fineness for the manufacture of brick is obvious. The harder stone gives splintery, angular fragments; the other, rounded grains. Experience shows that a hard rock like the Medina is required for a physically strong silica brick.

The white Medina which occurs in southern Pennsylvania near the town of Hyndman is there prominent and of a pure variety, but by no means as hard as the quartzite of Huntingdon County.

A representative analysis of the Pennsylvania quartzite is as follows:

	Per Cent
Silica (SiO_2)	97.80
Alumina (Al_2O_3)	0.90
Iron peroxide (Fe_2O_3)	0.85
Lime (CaO)	0.10
Magnesia (MgO)	0.15
Alkalies	0.40
	100.00

WISCONSIN QUARTZITE

This rock, much used in the manufacture of silica brick in the vicinity of Chicago, is known as the Baraboo quartzite from the town of that name where these measures appear, and near which are the quarries. The rock occurs in high cliffs throughout this region and is especially prominent around Devil's Lake. Here glacial action has excavated a deep, broad valley in the quartzite formation bounded on each side by cliffs several hundred feet in height. Their bases are covered with the loose rock split from the parent ledges. While the fragments are much larger as a whole than the weathered Medina of Pennsylvania, the quality by no means compares with the latter. Practically all the stone used in brickmaking is here quarried from the solid measures.

The marked peculiarity of this rock, as compared with the Pennsylvania quartzite, is its reddish color, which ranges from a light pink through a dark purplish red almost to black. It is often as red as the red Medina of Pennsylvania, a sandstone wholly unsuited for brickmaking. While the coloring of the Baraboo quartzite is due to iron, it is yet an exceedingly pure rock. The quartzite often becomes lighter in color as the quarry works in from the face of the cliff; but it is the exception to find white rock.

This Baraboo quartzite, setimated as some 4,000 to 5,000 ft. in thickness, is a metamorphosed sandstone, the sedimentary origin of which is indicated by its parallel bedding planes, by ripple marks, etc. Layers of quartzite are often separated by beds of quartz schist varying from a few inches to several feet in thickness. This schistose structure is due to the admixture during deposition of clayey material, which in the subsequent folding and bending of the rock has developed a slab-like or schistose structure.

The United States Geological Survey explain the formation of the quartzite as due to the enlargement of the original quartz grains and to the deposition of interstitial quartz. It was the latter that carried the iron oxide, giving the characteristic color to the rock. Regardless of its color, the formation throughout shows the physical characteristics of hardness and strength, and the splintered and angular fracture in crushing, identical with the Medina quartzite of Pennsylvania.

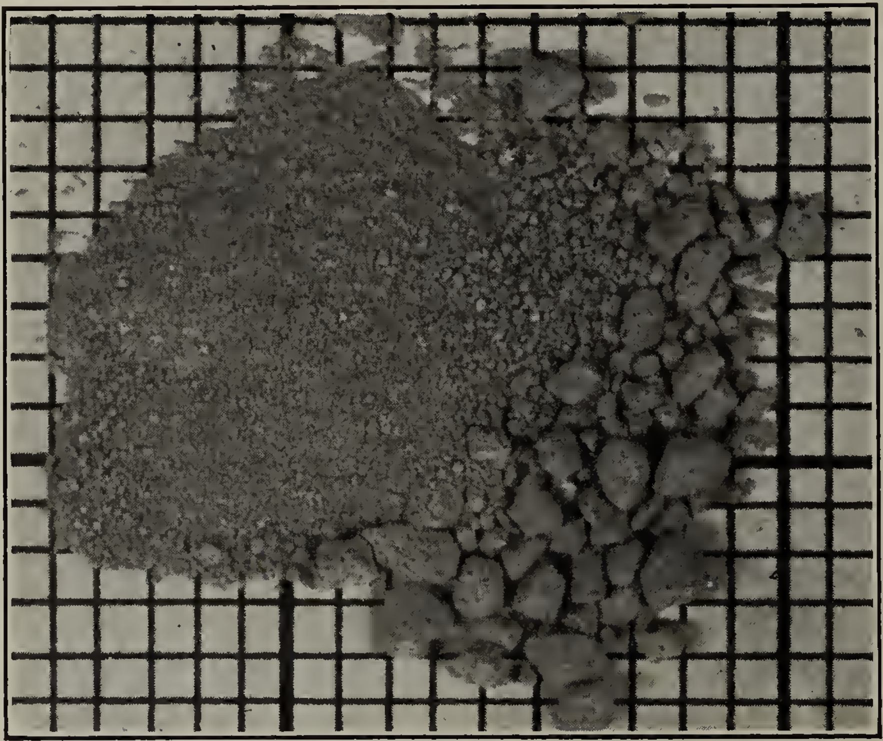


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Figure 1. Material From Unburned Average Standard Nine-Inch Brick

A typical analysis follows:

	Per Cent
Silica (SiO_2)	97.15
Alumina (Al_2O_3)	1.00
Iron peroxide (Fe_2O_3)	1.05
Lime (CaO)	0.10
Magnesia (MgO)	0.25
Alkalies	0.10
	99.65

ALABAMA QUARTZITE

The material used in silica brick manufactured in Birmingham, Ala., is found in the eastern part of that state. It is bluish white, and as hard and crystalline as the Wisconsin quartzite; average analyses show it to be equally pure. It occurs in lenses of varying size, in a sandstone formation. It is probably a quartzite formed by a leaching out of impurities from the parent rock followed by a crystal growth and additional deposit of silica from circulating waters. A typical analysis follows:

	Per Cent
Silica (SiO_2)	97.70
Alumina (Al_2O_3)	0.96
Iron oxide (Fe_2O_3)	0.80
Lime (CaO)	0.05
Magnesia (MgO)	0.30
Alkalies	0.31
	100.12

In Colorado and Montana both quartzite and sandstone are used to some extent in the manufacture of silica brick.

QUARRYING

The methods of quarrying as necessitated by the mode of occurrence of the quartzite are so obvious as to need no description. The only point which is of importance is that of adequate supervision in the selection of the rock, whether it be from floes or from the solid measures. Whatever the location or occurence of the rock, such care is essential; the easiest way to keep bad rock out of the brick is never to let it reach the plant.

GRINDING

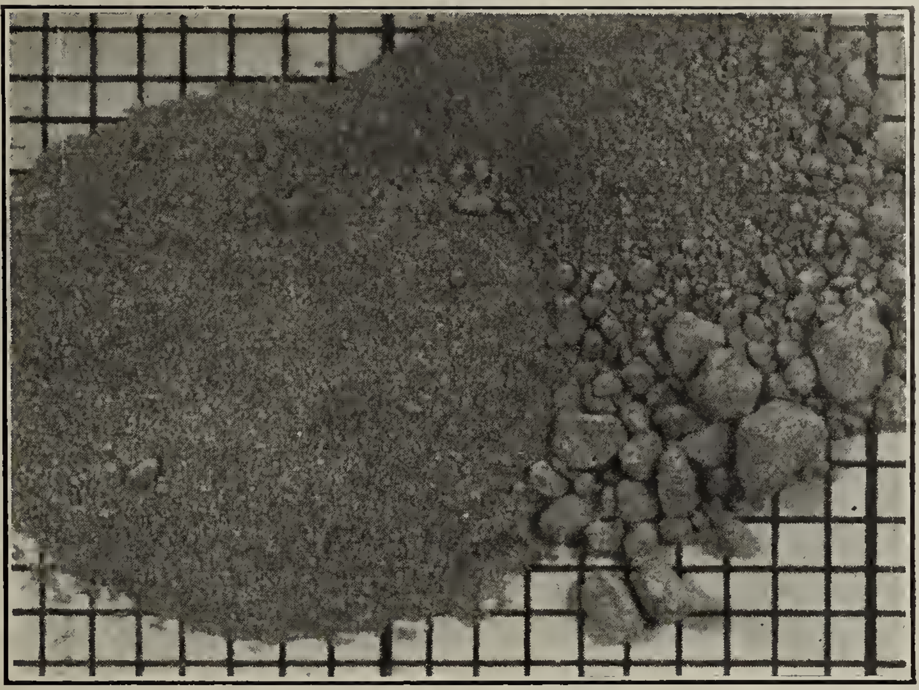
After the rock broken to one-man size is received at the rear of the brick plant, it is put through some of the familiar types of crusher, which reduces it to practically the size of a 1 to 2-in. ring. It is then elevated to storage bins from which it may be fed direct in definitely weighed quantities to the wet pans for grinding.

Into the wet pans, as the grinding proceeds, 2 per cent of lime, by weight, is introduced as milk of lime. When the brick is burned, the lime in combination with the other elements in the mass serves to give the necessary bond or physical strength. The quality of the lime has no small effect upon the resulting characteristics of the brick. The effect of an increase in lime from 2 to 3 per cent is not marked; but such as it is, renders the brick less able to withstand abrasion, as is indicated by rattler tests. The decrease in strength on further additions of lime up to 7 per cent is progressive, and becomes more and more evident with each addition. There is, on the other hand, a decrease in strength at 1.5 per cent of lime, and a marked weakness and friability as the amount of lime is still further diminished. As regards ultimate refractoriness, no marked effect is noticeable upon increasing the lime addition up to 3 per cent. From that point on the effect is clear in a lowering of the fusing point.

The fineness to which the charge in the wet pan is to be ground depends upon the nature of the brick to be made from it and is, of course, controlled by the time during which the charge is allowed to remain in the pan. In general, one charge, containing material for 200 brick, will be ground by approximately four pans per hour for standard 9-in. brick, while to obtain the fineness requisite for the intricate and difficult shape-work necessary in by-product coke-oven construction, but two pans per hour may be possible. The rock is exceedingly hard, and a comparatively slight increase in the fineness of grind is accompanied by a seemingly disproportionate lowering of grinding capacity, and increase in wear on the pans.

The actual differences in grind, however, are much smaller than is often imagined. Figs. 1 and 2 are photomicrographs with a magnification of 2 diameters, the ground material showing on a background of cross-section paper with 0.1-in. spacing. The specimens are from pieces of green or unburned silica brick, crushed down after drying. Fig. 2 indicates typical fine-ground shape-work, while Fig. 1 is that of average standard 9-in. brick. The difference between these is also shown in the screen analysis of the two.

It will be plainly apparent from the photomicrographs that the difference lies not so much in the actual size of either the coarse or the fine grains as in the relative proportion of fines. In the finer-ground brick the larger proportion of these is clearly evident. There can be no question that the general effect of increasing the fineness of grind is to improve the abrasive resistance of the brick, if it is properly burned. In general, the requirements as to grind contained in typical coke-oven specifications have worked no hardships upon the manufacturer, for the present-day standard of workmanship on by-product oven shapes is such as to "carry its own grind with it," if the expression may be used. To secure the accurate filling out of the shapes, and the clean-cut accuracy everywhere essential, the grind is actually much finer than is requisite to satisfiy the usual specifications as to that particular feature.

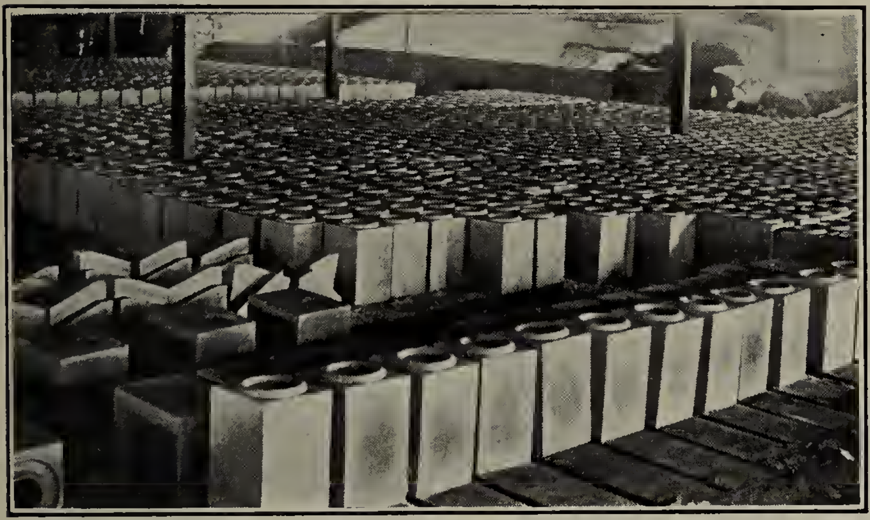


Cut by Courtesy of "Metallurgical and Chemical Engineering"

Figure 2. Sample Showing Material Used in Typical Fine-Ground Shape Work

MOULDING

The ground silica material as ready to mold is of about the consistency of damp sand, but (possibly because of the extreme angularity of its grains) has less flow as it is manipulated. As a consequence, the molds must be filled by pounding with heavy plank beaters covered with metal, and all corners and shapes of irregular outline must be rammed in by hand, much as sand molds are made, but with much heavier blows. Unequal ramming, leaving too great a variation in the density of the green brick, will give unequal expansion in the kiln. It is by no means uncommon to lose hundreds of a new and difficult shape through such fire-cracking. To get proper molding and ramming requires the strictest supervision.



Cut by Courtesy of "Metallurgical and Chemical Engineering"

Figure. 3. Typical Section of Hot Floor, Showing Coke-Oven "Gun" Brick Shapes in Process of Drying

The wear on the molds due both to the attrition of the grains and the pounding is exceptionally severe. In view of the extreme accuracy required, steel molds are used exclusively for all high-grade coke-oven work. These molds are often decidedly complicated, and always expensive, as "loose sides" must be used throughout. Ground silica has, as molded, almost no physical strength, and can be taken from the mold only by allowing the sides to come with it, after which the sides are stripped. After molding, the shapes are placed on pallets, on which the brick are dried on the steam-heated hot floor (Fig. 3) or on rack cars in some form of tunnel drier. The brick are then ready to be set in the kilns. Although setting is a most important feature in the manufacture the author will not attempt to discuss it here.

BURNING

The vast majority of silica brick are burned with soft coal in the familiar type of round, down-draft kiln, varying in diameter from 30 ft. upward. Although practice may vary somewhat, and much depends on the size of the kiln, the following schedule of burning may be considered as fairly normal. Assume that the setting is complete and the doors are sealed. Fire is immediately started, and continued slowly and with slight acceleration for from nine to twelve days, during the last two or three of which the final temperature should be practically maintained. The kiln is then held at the required temperature, say a 26 cone (1,650 deg. C., or 3,002 deg. Fahr.) directly in front of the firebox, for another day, after which the fireboxes may be sealed and allowed to remain thus for approximately 24 hrs. more. Cooling will require about as long as the burning proper; but this varies somewhat with atmospheric conditions.

It is obviously difficult to take temperatures in the interior portions of the kiln except by cones; but there are often most perplexing variations in this method. There are apparently certain conditions in the atmosphere of a burning silica kiln which alter the readings of standard cones to no small degree. Cones which give concordant results, week in and week out, in clay kilns are often decidedly erratic in registering the temperatures of silica kilns. It is by no means uncommon to witness cones of higher number go down, while next to them those lower in the series are either but slightly bent or apparently unaffected.

EFFECT OF BURNING ON COMPOSITION AND EXPANSION

In any discussion of the desirable qualities of silica brick there is frequently expressed the necessity that "all the expansion shall be burned out of them." This brings out the questions: to what is the expansion due; how may it be completely effected if that he possible; and by what means can that result be ascertained.

That the terms used in the discussion may be clear, let it be premised that all silica brick are of course made in molds smaller than the proposed size of the finished or burned brick, and that under the influence of heat a permanent expansion occurs, swelling the brick from the mold or "green" brick size to the required or "burned" size. It is this expansion occurring during burning that it is desired to accomplish so completely as to preclude further expansion in subsequent use.

(To be Continued)

DIES *for* HOLLOW WARE

Many Brick Manufacturers Are Considering Changing Over to Make Hollow Tile. Here Are a Few "Do's and Don'ts" That Will Prove Valuable

By A. F. Greaves-Walker

Author of "The Design and Construction of Down Draft Kilns," "Setting Down Draft Kilns" and "Running a Plant to Capacity"

(*Continued from January* 18 *Issue*)

RAW MATERIALS, that is, the clay or shale which is used—naturally have a very considerable bearing on the type of die as well as on its construction and methods of adjustment. Some materials slip thru a die like so much grease, while others offer a very strong resistance. Furthermore, some materials can be run thru a die in a very soft condition, while others have to be very stiff. It is apparent that under these conditions, a wide variation in die construction is possible.

Where an easy running material is used, the dies can be built very light, the bridge and posts being reduced to a minimum. On the other hand, where a hard running clay is used, or where it is necessary to run it very stiff, the bridges must be heavy and strong. Light die construction usually produces fast dies, while heavy construction tends to produce slow ones. As a general rule, it may be said that a die with considerable metal behind it will require more adjusting than one with less.

Every ounce of metal added to the back of a die offers resistance to the clay flow—in other words, acts as a baffle. It therefore pays well to closely study the raw materials available, in order to so handle them that the lightest possible construction may be used in the die and behind it.

It is a noticeable fact that weathered materials slip thru a die easier than unweathered materials. Most clay and shale banks have a covering of weathered material. When care is taken to get the *maximum percentage of this weathered material mixed with every load that goes to the pans,* the best results are generally obtained. When enough of this material is not available to get the best results, *unweathered material should be weathered whenever possible.*

Many clayworkers would be surprised at the results, in the way of increased column speed, the lowering of power consumption and the reduction of die wear that follow the use of material that has been given even a slight weathering, as compared with the results obtained with unweathered material.

A slight weathering may be given by shooting ahead at the bank with, of course, due precaution for the mixing of this material with that which is newer. Very often the addition of the slight percentage of surface clay (when this is available) will have a beneficial effect upon column speed, power consumption and die wear.

Fineness of grain (or fine grinding) has a far greater effect on tile dies than most clayworkers realize. Coarse materials will invariably slow-up a die and, in most instances, make the column "drag" at the corners. The writer has observed cases where new screen-plates in the pans, and new screens ahead of the pug-mill have "speeded-up" a whole set of dies from eight to ten feet per minute, and at the same time, eliminated the "dragged" corners. *Whenever a die slows down for no apparent reason, look at the plates in the pans and see if the screen-boy is attending to his business.*

It must be remembered, too, that the drying qualities of the raw material have a very considerable bearing upon the die and upon its proper adjustment. Some clays will go thru a drier without loss, even when run on a die that is decidedly unbalanced. Others require dies that are in the most perfect adjustment. Cases are known where it seemed practically impossible to run ware on certain dies without excessive—it may be said prohibitive—drier loss, and where it was found that various substances could be added to the clay that would make it work with these same dies, and without a marked drier loss.

The most common of these materials is "grog"—ground-up burnt ware. This is ground in the pans with the clay or shale. Other substances very successfully used are tannic acid in crystalline form, common salt, raw limestone and slacked lime. *Sometimes less than one per cent of these substances will overcome very bad cases.* The raw limestone and salt have especially proved successful.

Even with clays which dry easily and with dies that are perfectly balanced, heavy losses will occur if ware is "rushed" thru the driers. While there are materials which will not stand a progressive tunnel-drier treatment, there are, fortunately, many that do not require the slower hot-floor or open-room treatment. Experiment, patience, and a great fund of common sense are important requisites—in fact, the onlv guides.

ONE VERY IMPORTANT POINT

Brickmakers and other clayworkers have, in many instances, unsuccessfully attempted to make hollow ware. After a comparatively short trial they have given it up, with the impression that the available raw materials were not suitable. In the writer's opinion, the clay was blamed for the fault in the men, who did not have the "stick-to-it" quality that is necessary to success.

The writer believes it perfectly safe to say that *any material from which other structural products are made can be successfully used in the manufacture of hollowware.* Plants have been known to work for two years or more before successfully solving their problems, during all of that time meeting with a loss of from one-quarter to three-quarters of all of the ware that they made. *But in the end, they were able to successfully work the available raw material,* and with losses that were very inconsiderable.

The surface clays of eastern Canada are unquestionably the most difficult to handle on this continent, no matter what products are made from them. In spite of this, four large plants are manufacturing fire-proofing from them, and are turning out a product that will compare favorably with anything in this line made at any other point in America, *and with less loss than the average American plant.*

These results were not accomplished without years of experimenting and a large money outlay, but they stand as a lasting record of what can be done with "impossible" materials, if the nerve and determination is there to make those materials "possible."

The "never-say-die" rule should be adopted by every clayworker who goes into the hollowware game. Before starting, however, he should get all of the information that it is possible for him to obtain, regarding his material. Then he should go after information relative to dies and machines. When he comes to the point where he must select one type

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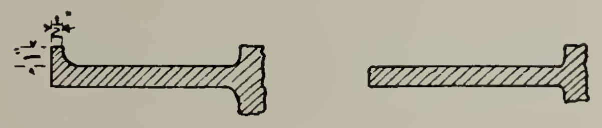
of die, he should work with that type until he becomes acquainted with his own peculiar and particular requirements, and then, with the original die as a starting point, evolve a die that is suitable for his materials. Radical changes almost always mean starting all over again. It pays to go slow.

AUGER CONSTRUCTION

Probably less is known about scientific auger construction than about any other subject connected with the hollowware or brick industry. Practically all of the progress that has been made has been thru the efforts of the men who make clayworking machinery in their attempts to provide augers to suit the various materials that have been met with. No data is available and only a few general rules are adhered to. One thing, however, is known; that is, that *the design of an auger for hollowware should be different from that of an auger that is used in the manufacture of brick.* In the former, the diameter remains constant, with the pitch sometimes constant, but generally increasing; in the latter, the diameter decreases with the pitch constant, or increases only enough to maintain the area between the flights constant.

All three types of augers, single, double and triple wing are used. The single wing is the fastest, without question, but as a rule the die must be placed so far from the auger (in order to overcome the unequal flow and the lamination) that this advantage is lost. The single wing auger also has a great tendency to make dies flow fast in the center and to cause lamination. This often necessitates heavy baffling at that point, which reacts against speed.

As a general rule the single wing auger is to be avoided, especially by the man who is inexperienced. Equal pressure over the face of the die is hardest to get with this type, and warped ware—especially with thin shapes—often results from its use.



Section of Auger Flight With and Without Lip
Fig 4

The double wing auger is most generally used and gives good results, altho there are cases where the triple wing has made a marked improvement over it. Theoretically the triple wing should be best and give the least amount of die trouble, on account of the even pressure given the column. Three wings, however, displace considerable clay in the machine barrel, which may be a serious matter where large tile are to be made. Also more friction is set up in the barrel and more power consumed, and where hard running clays are encountered this may seriously interfere with column speed.

In some cases, the auger is run thru the barrel as a continuous screw. This may be single part of the way and double the balance, or double all the way; in the case of a triple wing it may begin as a single under the hopper, then change to double and finally change to triple at the tip.

In other cases the screw is broken in the sections back of the tip or ordinary knives are used, as in a brick machine. Materials vary so much that only by experimenting in each case can the best type be determined. It will pay handsomely, however, to spend a little money in this direction, as results vary greatly in every case.

One of the most annoying troubles encountered in tile manufacture is due to *auger wear.* A die may be made to run perfectly and at a satisfactory speed with a new auger which has been run just long enough to get a polish, but this same die will begin to be troublesome as soon as the auger begins to wear at the circumference and a space is opened up between it and the barrel. This space around the auger offers a point of release for the clay and allows it to slip back, in other words, *it allows the pressure to be released at the outside corners and walls of the die,* while the center keeps up its speed.

The result is an unbalanced die and the necessity for baffles in the center. Just as soon, however, as a new auger is put on, the center is slow and these baffles must be removed or smaller ones substituted. Taking care of this auger wear is a serious problem and one that is met in practically no other branch of the industry.

ALLOY STEEL AUGERS.

In the writers' opinion, hollowware manufacturers—especially the larger ones—who have made no move in this direction would do well to abandon the ordinary chilled semi-steel auger which loses its "skin" in a short time, and experiment with augers of alloy-steels such as manganese, chrome, nickel or vanadium.

Some have done this and given it up as a bad job simply because it took too long to give them a polish, but the matter of polishing an auger is another annoying problem to the tilemaker, and one that can be eliminated to a great extent if he will tackle it in the right way.

Taking a certain die for example, which under good conditions will run 12,000 ft. per day; when a new auger is put on, this same die will run 5,000 ft.—probably the second day it will run 7,000 ft., the third day 10,000 ft. and on the fourth day, will be up to capacity.

The total loss of 10,000 ft. of ware or practically a day's run with a value of, say, $250 is chargeable to "polishing the auger," and this may happen every twenty to fifty days, according to the raw material.

Now is such a loss necessary? Some tilemakers have come to the conclusion that it is. How many of the augers used come from the manufacturers with just the rough spots knocked off the casting with a grinding wheel? *Probably* 98 *per cent.* And where is the real polishing done? *In the machine, and at a cost of from* $200 *to* $500; for besides the actual loss in ware, the overhead expenses must be added and the increased power consumption of the machine.

Cutting down the expense is really a rather simple matter; if the auger had been polished before it went into the machine the trouble would be practically eliminated, for, as one of the clay machinery companies recently remarked in an advertisement: "The machine is not the place to polish the auger."

If the clayworker would insist on it and pay for it, undoubtedly the machinery people would polish the augers to a glasslike smoothness. If they will not or cannot, the clayworker can himself install a portable grinding and buffing wheel with a flexible shaft, at less than half the cost of polishing one auger in the machine, and with a labor cost of $5 or less, grind and buff every auger until it shines like a mirror. Of course, even with this done the auger will not get up to speed for a few hours or a day, but so little difference would be noted that the terrors of a new auger would be no more.

Tilemakers who are using an auger without a lip (Fig. 4), would do well to have one put on their pattern. Such a lip adds considerable life to the auger by keeping the edge from so rapidly wearing away.

When the barrel liners of a machine have worn to such an extent that considerable space is left around a new auger, it is time to consider a new set of liners. Worn liners have the same effect on a die as a worn auger, and tend to seriously decrease the life of an auger by allowing the clay to slip back around it. *One-half inch* is considered the maximum space that should be allowed around an auger and this is often too much.

DISTANCE OF AUGER FROM DIE

Hollowware machines are supplied with extension rings so that a die may be placed at its proper working distance from the auger. This distance is exceedingly important in die adjustment and much trouble comes from the fact that many clayworkers give the matter no consideration. Tile of no great variation in size can generally be run at the same distance, once the proper distance is determined. *But when there is a great difference in size the distance will change with the majority of raw materials.* The proper distances cannot be specified under any circumstances, as it is absolutely a matter of experiment. The type of machine, speed of machine, raw material and dies are all determining factors.

The increase or decrease in this distance will often correct die trouble without anything further being done. A die which will not make a single good tile when placed five inches from the auger tip may run splendidly at ten inches.

It should be borne in mind, however, that with each fractional increase in the distance of the auger from the die, the power consumption of the machine is greatly increased. It is therefore necessary to place the die *as close as possible and still get good results.*

Warping and cracking is often caused by having the die too close to the auger. This is due to the weave given the column by the auger. When the die is very close, this weave is noticeable as the column runs out; but at other times it does not show up until the ware is dry.

It is always well, therefore, when attempting to adjust a die to be sure the distance is correct, for in many cases nothing can be accomplished unless that is first made right.

Another matter connected with this distance (and very important in some cases where large tile are made) is the space between die and auger which acts as a reservoir from which the clay is evenly forced thru the die by the "push" of the auger behind it. Unless this reservoir is large enough, or, in other words, *the bulk of the clay between die and auger is great enough,* the auger action or pressure is likely to be localized, the tendency being towards fast flow in the center and slower flow at the outside. This trouble is usually overcome by baffling the center of the die, which will necessarily slow the column and cut capacity. A correction can often be made by increasing the distance of die from auger without a reduction of speed. (*To be continued*)

CLAYWORKERS *aid* ART COMMISSION

Minnesota Art Commission Appeals to Northwestern Clay Association for Funds to Prepare Plans and Specifications for Low Cost Fire-Safe Homes

PLANS for low-cost, fire-proof homes, to be compiled and distributed by the Minnesota State Art Commission to the citizens of that state, were made possible when the Northwestern Clay Association accepted the offer of Maurice I. Flagg, director of the commission at the annual banquet of the association held on January 20 at the Hotel West, Minneapolis, Minn. But of far more consequence than words of acceptance, was the action of the members in voting to raise a fund to defray a part of the expense in publishing these plans, and of pledging more than half of the required amount, before the close of the banquet.

Mr. Flagg was the principal speaker at the informal banquet which closed the first day's sessions of a convention that was smaller than last year's gathering in attendance, but not lacking in enthusiasm. In a talk that was replete with stories of interesting experiences in his travels thru the state, Mr. Flagg told of the work that his commission was doing in providing plans for model and inexpensive farm houses and city homes.

The method followed in distributing these plans is rather unique and proves beyond a doubt that a man appreciates an article for which he has to pay a price much more than something which he obtains free of charge. The "model farmhouse" or city home plans of the commission are not given away, but can be obtained for the sum of $3.50, which covers the cost of complete plans and specifications, such as would ordinarily cost from fifty to one hundred dollars were they purchased from a practicing architect.

The number of plans distributed under this method has reached into the millions. Mr. Flagg pointed out the fact that the distribution of these plans does not interfere with an architect's practice because people who can afford but a few thousand dollars for a home, seldom, if ever, employ an architect. This being the case, the work of the Minnesota State Art Commission has filled a long felt want in supplying real plans for attractive homes of low-cost which are usually built without any plans or architecture.

In the past, these plans and specifications have been, almost exclusively, for frame buildings. Now, however, from the farms and small towns of the state has come a demand for fireproof homes and, anxious to give the citizens what they want, insofar as it is possible, the commission has asked the co-operation of Minnesota clay products manufacturers in the launching of a campaign for better-designed, low-cost homes of brick and hollow-tile.

This suggestion, made by Mr. Flagg in an address entitled "What Two Loads of Brick Can Do," was received with considerable enthusiasm by those present and the work of raising the necessary fund started immediately. A representative of the bricklayers' union was present, who stated that he was authorized to say that his colleagues would support the campaign with their money.

The convention opened on the morning of January 20 with the usual routine business, registration, reports of the various officers and other detail matters. In the afternoon, Fred L. Schmidt, of Minneapolis, gave a stereopticon lecture on the "Economical Application of Electricity to Clay Plants," being followed by James F. Gould who took as his subject the "Treatment of Boiler Water and the Elimination of Scale." The last number on the afternoon's program was a witnessing of tests on the crushing strengths of brick and hollow-tile and of other materials, which were made at the City Hall, under the direction of James C. Houghton, a building inspector of

(*Continued on page* 251)

SCALE *vs.* BOILER EFFICIENCY

In Which is Shown the Heat Losses and Other Wastefulness Due to the Accumulation of Scale and the Necessity of Regular and Frequent Boiler Inspections and Subsequent Cleaning

An Article Abstracted from the "Publicity Magazine" and Bearing on an Important Phase in the Conduct of the Power Plant

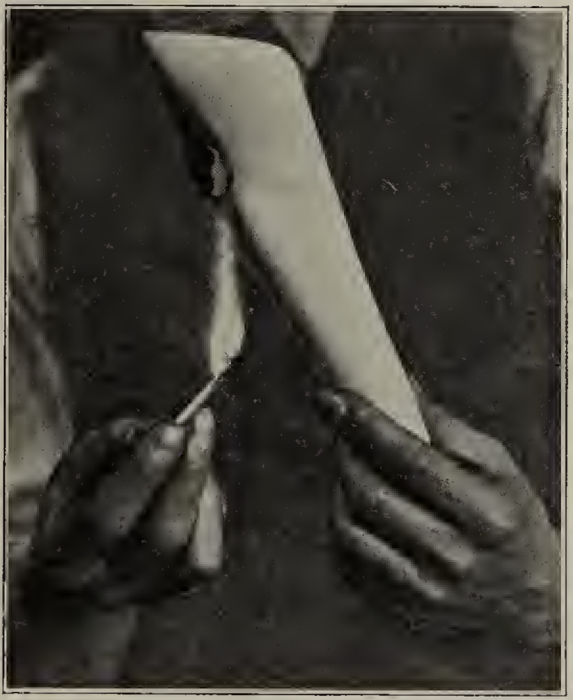


Figure 1

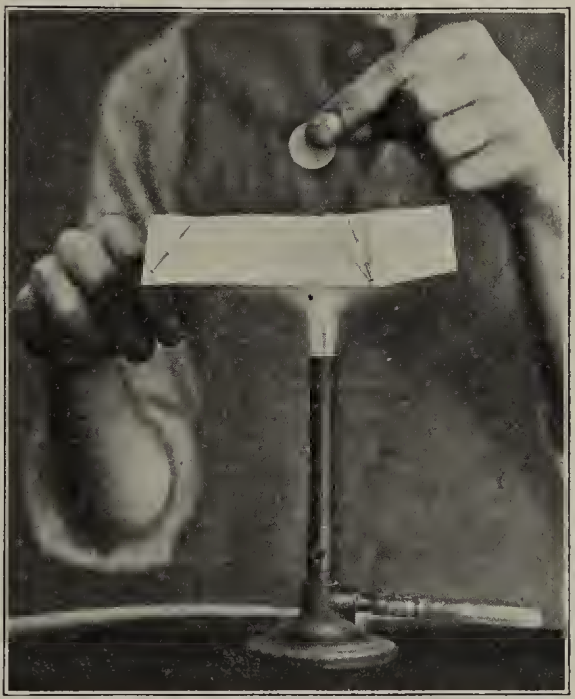


Figure 2

SCALE one-eight of an inch in thickness, means 18% more coal burned. Did you ever thing of this as applied to your boilers and to your coal pile? Are your boilers clean? Do you know for a fact that they are?

The presence of even small quantities of scale or oil in a boiler impairs its efficiency. An accumulation allows an over heating of plates that may lead to serious damage.

If water comes in direct contact with the plates the heat is absorbed, the temperature of the plates remains practically the same as the water and no harm is done. If there is a considerable thickness of impervious scale in the boiler the water cannot absorb the heat as fast as it is put into the plates by the furnace; as a result the plates become overheated, get red, become plastic and finally give way to the force of steam pressure.

An official of one of the large boiler insurance companies states that in his opinion the most frequent cause of boiler explosions is scale. The ultimate result of a neglected boiler is an explosion, but this article has to do only with the increased operating expense of such a boiler.

With well designed boilers absolutely clean and with perfect combustion in the furance, the best that one can expect is to use 80% of the heat value of the coal in making steam. The minute scale begins to form these conditions are upset and if every other condition remains the same the efficiency of the boiler begins to drop.

Under proper conditions the boilers convert into steam 80% of the heat value of the coal; with one-sixteenth of an inch of scale, the heating power is reduced 9% to 14% as shown in the accompanying tables so that boilers operating under these conditons with all other conditions perfect convert into steam 72.8% of the heat value of the coal, assuming a loss of only 9%.

A few experiments that require only the simplest apparatus and which can be made in a few minutes in any boiler room will convince the most skeptical that as long as water touches the container, the latter will not be damaged by heat—even intense heat; the presence of foreign matter between the water and its container retards the passage of heat and may result in the destruction of the container.

Figure 1 shows a cone rolled from a sheet of ordinary writing paper. It was partly filled with water and a match applied. The paper above the water line took fire and burned down to the water but no further. To make the test more conclusive, the flame from a gasoline blow torch was directed against the side of the water-filled cone until the water boiled—the paper was not damaged.

A variation of this experiment is illustrated in Figure 2. A sheet of the same paper as that used in the first experiment was folded into a rectangular box and pinned at the corners. One half of a glass of water (one fourth of a pint) was poured into it and placed over the burner. The water boiled in four and one-half minutes without any injury to the paper box. An iron washer was then dropped into the boiling water directly over the fire. Almost instantly the paper under the washer was burned away and the washer and water went thru the hole, putting out the flame.

In a second experiment with the paper box a pinch of fine sand was dropped into the water directly over the fire. The paper charred thru in twenty seconds and allowed the water to run out.

These tests prove that water will absorb heat so rapidly that even a paper container will not be damaged, provided the water is in direct contact with the paper.

If your boilers blister or your flues burn out, do not jump to the conclusion that your fire is too hot. Look inside the boiler for the trouble. Table I, published on the second page following, is taken from "Water Softening and Treatment" by W. H. Booth. It shows the loss of heat due to varying thicknesses of scale. Table II gives results of tests made at the University of Illinois, and shows a still greater loss of efficiency for given thicknesses of scale than does Table I.

In referring to these tables, consideration must be given to the character of the scale; for example, if the scale consists entirely of sulphate of lime, the fuel loss will be considerably greater than if it consisted of carbonate of lime. This, because the sulphate scale is hard and dense, while the carbonate scale is soft and porous. And while the former scale offers greater resistance to the passage of heat, owing to its hard and dense structure, it is well worth noting that a scale which would be porous under ordinary conditions, may become dense and hard when formed in the presence of oil.

Very rarely does scale form evenly over the interior of a boiler. In one place it may be ¼ in. and another 1/16 in. So many factors enter into the effect of scale on the fuel consumption that the only way to arrive at correct figures is to run a test with your boilers as they are — that is, before they are cleaned. Then run a second test, after they have been thoroly cleaned. The results are apt to be startling. Some time since, a report was received of a very unsatisfactory test that had been made by a prominent firm of consulting engineers on a 250 H. P. water-tube boiler, equipped with mechanical stokers. In a twenty-four hour test, they were able to develop only 164 H. P. or about 65 per cent of rating, with an evaporation from and at 212° F., or 8.85 lbs. of water per pound of coal. Tests made when the stokers were installed and the boilers clean, had shown excellent results. An engineer was sent to investigate, and found that the boiler had not been cleaned since its installation, six months before. After thoroly cleaning it, a second test was made, with the result that the evaporation from and at 212° F. was increased to 10.17 lbs. of water per pound of coal, and for ten hours the boiler developed an average horsepower of 406.2, or 165 per cent of rating.

Three methods are employed to combat the scale evil: First—Picking or scraping the surface of the boilers and the use of tube-cleaning machines. Second—Putting into the boiler a compound that will precipitate the scale-forming elements, so that they may be blown or washed out. Third—Treating the water, before it reaches the boiler, in order to soften it and to remove all impurities that would be apt to have any bad effect upon the boiler. Each system has its advantages, and the question of a choice must be made by the individual owner, with his own particular needs in mind.

Sample No. 1

Sample No. 2

Stoker manufacturers are interested in the maximum number of of pounds of water evaporated per pound of coal in boilers under which their stokers are in operation, so that owners of this equipment may secure the greatest possible return for their investment. Accordingly, in their literature they emphasize the coal saving feature, but there are many other advantages to be obtained by keeping the boilers constantly in first class shape. The saving in coal alone warrants all of the trouble that is taken along this line.

The two illustrations shown on this pags should

Table I

(W. H. Booth)

Thickness of Scale—inches	1/64	1/32	1/16	1/8	3/16
Loss of Heating Power—per cent	2	4	9	18	27
Thickness of Scale—inches	1/4	3/8	1/2	5/8	3/4
Loss of Heating Power—per cent	38	48	60	74	90

have interest for the reader who owns or operates a boiler. The first illustration (Sample No. 1) shows scale taken from a return tubular boiler reported as "clean." The front of the boiler was clean—as far back as could be seen by casually looking into the manhole in the front. Subsequent examination brought out the fact that the scale was so thick at the rear sheet that it extended up and around the fire-tubes.

The point where the scale touched the tubes is clearly shown in the illustration at "A" and "A". To get it out, some of the tubes had to be removed. The boiler leaked at the rear tube sheet—and no wonder.

Sample No. 2 is a section from a vertical water tube. The engineer had never cleaned the boiler, because he thought scale could not lodge in a vertical water tube. Some of the tubes were so filled that a rod could not be pushed into them.

These are but two of many samples that have been shown the writer of this paper. They will serve, however, to show that eternal vigilance is the price of boiler safety, as well as boiler efficiency. If anything else is needed, it is the admonition: Clean Your Boilers When They are Dirty—Don't Wait for the Calendar to Tell You When That Is.

Table II

(University of Illinois)

Character of Scale	Composition (Mostly)	Thickness (inches)	Per cent Loss
Hard	Carbonates	1/50	9.4
Soft	Carbonates	1/32	7.2
Hard	Carbonates	1/32	8.5
Soft	Carbonates	1/25	8.0
Hard	Carbonates	1/25	9.3
Hard	Sulphate	1/20	11.1
Soft	Sulphate	1/16	10.8
Soft	Carbonates	1/16	11.0
Soft	Carbonates	1/16	12.4

BOOM TIMES *among the* POTTERIES

Judging from the way in which orders are now being placed for American pottery, manufacturers will not be lacking for business during the remainder of the year. Many buyers want goods delivered within two weeks or a month, and are disappointed if they cannot secure shipments in that time. In the past, these same buyers have been satisfied if their wants were filled within six or eight months after the order was placed. Never before this, have domestic potters started a year with as much business on their books.

Buyers of domestic pottery have not inquired very much for cheap lines of ware. On the other hand, the volume of business is leaning toward the more costly decorations. The demand for a high grade of American pottery is developing that will be hard to displace when the war lords have agreed to smoke the pipe of peace. Large jobbers now realize that they can get merchandise in a reasonably short time, when compared to foreign deliveries, and can turn their capital over more frequently when handling domestic lines than otherwise.

It is not likely that a general ware pottery will be erected at Sistersville, W. Va., this year, as eastern interests who were to back the proposition have turned their attention to other matters. An East Liverpool (Ohio) architect had prepared plans for a plant. These were taken to New York only to be pigeon-holed.

The A. E. Hull Pottery Company of Crooksville, Ohio, which has heretofore been making a specialty of stoneware, is now manufacturing a white body. Several of the lines now being made in this new body were formerly imported. This company has booked a large number of orders which will keep its plant in operation for several months to come.

The idle plant of the General Electric Porcelain Company at East Liverpool, Ohio, has been sold to the Louthan Supply Company of that city which will use it in the manufacture of clay gas mantle appliances.

At the annual meeting of the Guernsey Earthenware Company, Cambridge, Ohio, Dr. Charles L. Casey was re-elected president and general manager, and T. F. Reid was chosen as vice-president.

The Albright China Company of Carrollton, Ohio, elected William T. McNutt as president at its annual meeting held recently. Other officers elected were: A. E. Albright, vice-president; I. E. Mincks, secretary; Ralph G. Wright, treasurer, and A. E. Albright, gen. mngr.

S. M. Ferguson of East Liverpool, Ohio, formerly manager of the Albright China Company's plant at Carrollton, Ohio, is now general manager of the Salem China Company's plant at Salem, Ohio.

"Movies" of the manufacture of chinaware from the time the clay is taken from the ground until the finished ware finds use on the table in the American home are being shown at the Cleveland (Ohio) Food and Industrial Exposition which opened on January 31. The films were taken at the plant of the French China Company.

The annual banquet of the Trenton (N. J.) Potteries Company was held on January 11, when the members of the firm entertained the office force and factory department heads at the Trenton Country Club. A splendid menu was served, followed by an interesting program.

The Decatur (Ill.) Brick Manufacturing Company Believes in Outdoor Display Advertising

Clay Products Considered as Engineering Materials

A Paper Presented at a Meeting of the International Engineering Congress, 1915, in San Francisco, Cal.

By A. V. Bleininger, B. Sc.
Bureau of Standards, U. S. Department of Commerce.

(*Concluded from the January* 18 *issue.*)

WITH reference to the resistance of vitrified well-glazed sewer pipe to the corroding influence of sewage, there can be no question but that such a surface is ideal from this standpoint. No other material can be expected to show such inertness to chemical agents and electrolysis. The question of proper joints is an important one and perhaps the best treatment of this point has not yet been developed.

DRAIN TILE

An exhaustive study of the strength of clay drain pipe has been made by Committee C-4 of the American Society for Testing Materials. The required average supporting strength of tile, tested according to methods outlined by the Committee*, are compiled in Table X.

Table X

	Pounds per lineal foot.		
Diameter	Class No. 1 B	Class No. 1 A	Class No. 1 Extra A
10	600	....	....
12	700	900	1,000
14	800	1,000	1,200
16	900	1,200	1,500
18	1,000	1,300	1,700
20	1,100	1,400	2,100
22	1,100	1,550	2,300
24	1,200	1,700	2,500
26	....	1,800	2,600
28	....	1,900	2,800
30	....	2,000	3,000
32	....	2,050	3,200
34	....	2,150	3,300
36	....	2,250	3,500

No. 1 B tile are intended to be suitable for supporting the load in the worst material in a trench having a grade line 5 feet deep. Class No. 1 A tiles shall represent good materials and are intended to be suitable for supporting the load in a trench having a grade line 7 feet deep.

No. 1, Extra A tiles shall be very good and vitrified and shall be able to support the load in the worst material in a 10-foot trench.

REFRACTORIES

Fire clay refractories, according to their resistance to high temperatures, are divided into No. 1, No. 2 and No. 3 materials. The first class of refractories, when tested in a suitable furnace, should be able to withstand a temperature of not less than that corresponding to pyrometric cone No. 31 (approximately 3,065° F.); the second class, cone 28 (about 2,975° F.); and the third, cone 26 (approximately 2,912° F.). It is extremely important that fire brick should be burned, in manufacture, to a high temperature, in order that they should remain as constant in volume as possible when built up into furnace walls. A test bringing out this behavior is very important. It consists in heating up full-size brick, in a properly constructed furnace, to the temperatures corresponding to pyrometric cones Nos. 14, 12 and 8, respectively, i. e., 2,570°, 2,462° and 2,282° F., for the three classes of products and holding the temperature for six hours. The linear contraction or expansion (in the case of silicious materials) should not be more than 2 per cent.

In many constructions the load-carrying ability of fire-brick and other shapes is an important factor. This applies especially in gas benches, where loads as high as 25 pounds per square inch may be reached. Hence a load test bringing out the behavior of clay refractories seems essential. In the Pittsburgh Laboratory of the Bureau of Standards, such a test has been worked out, and consists in applying a load of 50 pounds per square inch at a maximum temperature of 1,350° (2,462° F.). This temperature is reached in five hours and is maintained for one hour. The load is applied by means of a weighted beam, the pressure being transmitted thru an opening in the crown of a gas-fired furnace by means of a very refractory column. The brick are tested on end. High-grade clay brick should show a contraction of not more than 7% of the original height and no evidence of flow, deformation or cracking. It is quite possible that high-grade brick, well grogged with properly-sized calcined material, can be made, which will show practically no contraction, tho only a few brands of this kind are being manufactured at the present time.

The load test* may, in fact, be considered a modified fusion test. Frequently the fusion point determination is misleading, owing to the fact that clays do not possess a melting point in the sense of metals and minerals. Owing to its high viscosity, a specimen of fire-brick may stand up under its own weight to quite a high temperature, altho it would give way at a fairly low temperature under the conditions of pressure prevailing in a furnace crown or gas bench. The load test, therefore, overcomes this condition and tends to rate the material at its true value.

Chemical analysis frequently is of service in estimating the value of a refractory. Two kinds of clay fire-brick may be considered to exist, those approaching the composition of the pure clay substance, 53.8% silica and 46.2% alumina, in the burned condition, and those of a more silicious nature, with as high as 85% silica. The latter approach the so-called silica brick in their properties, being less refractory, showing excellent standing up qualities in the load test, expanding instead of contracting in use, and being more sensitive to sudden temperature changes. Fluxes like iron oxide, potash, soda, lime and magnesia are more effective in lowering the softening point of silicious clays than of the aluminous type.

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*Year Book, Am. Soc. Test. Materials, 1914, p. 323.

*Bureau of Standards Technologic Paper No. 7.

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High-grade clays should not contain more than 5% of the above fluxes.

For conditions involving rapid temperature changes, porous high-grade clay brick, containing a large amount of calcined material, are more satisfactory than silicious materials.

Other functions are frequently of considerable importance, such as resistance to the attack of slags, glasses and reducing gases. In such cases proper sizing of the calcine, dense pressing and hard burning are essential.* In addition, close mortar joints are important. Tests can be made for the estimation of this quality by making cubes of the fire-clay body containing a recess in which a quantity of the slag is put. By heating the specimen beyond the melting point of the slag, the degree to which the structure withstands the attack may be determined.

THERMAL CONDUCTIVITY

The thermal conductivity of fire-brick is a direct function of the porosity. Thus, a dense brick showed at 1,400° F. a heat flow of 124 B. t. u. through one square foot area, one inch thick, per 24 hours, and for a temperature difference of 1° F. A somewhat more porous brick, under the same conditions, conducted 87 and a *kieselguhr* brick, extremely porous, 22 B. t. u. The thermal conductivity of fire-brick varies also with the temperature, as is shown in recent work by Heyn† which is compiled in Table XI. Here the value of K represents the heat flow, in calories per second, through 1 sq. cm. and 1 cm. thickness, per °C, temperature difference. The figures are of the order K = 0.001 = 100.

Table XI

	K at the temperature, °C.						
Kind of fire-brick	**200**	**400**	**600**	**800**	**1,000**	**1,100**	**1.200**
High Clay	145	180	220	240	260	270	......
More silicious	115	140	165	190	215	......	......
Silicious	90	110	125	130	130	......	......
Silicious	210	245	270	270	270	270	270
Silica brick	135	160	170	170	180	210	240
Magnesite	110	115	120	130	140	140	......

It seems that reheating changes the conductivity of fire-brick as the structure is altered.

The specific heat of fire-brick likewise changes with the temperature. This relation is expressed by Mellor** in the equation:

$S = 0.193 + t,$
where S = mean specific heat and
t = temperature, °C.

The true specific gravity of the fire-bricks varies from 2.622 to 2.755, as determined upon 28 specimens of American materials.††

The coefficient of expansion of fire-clays, again, is a function of the temperature, as well as the number of reheatings to which the specimens have been subjected. The available data are very meager. P. A. Boeck††† thus found the coefficients for ball clay burnt to cone 12 to be as follows:

Between 24° to 100° C.	1,316x10.8	1,310x16.8
Between 100° to 200° C.	1,710x10.8	1,610x10.8
Between 200° to 700° C.	558x10.8	680x10.8
Between 200° to 900° C.	....	567x10.8

These relations also show discontinuities, indicating thermal reactions. In the case of a fire-clay the mean coefficient of expansion (referred to 1° C.) was found to be 0.0000097.

FLOOR TILES

Two kinds of floor tiles are commonly used, the thoroly vitrified, non-absorbent variety, in various colors, and the hard, usually dark red "quarries," which, tho well vitrified, are not completely impervious.

Where sanitary conditions are the main consideration, only non-absorbent tiles can be used. In such materials the absorption should not be more than 0.05 per cent. The so-called ink-test may be misleading; hence, it is best to rely upon the absorption. Other tests may be applied, as the transverse and the ball impact test. These have not been sufficiently standardized to make possible the fixing of limits. Some work along these lines has been reported by F. B. O'Connor.* In these tests the average modulus of rupture was found to vary from 7.422 to 3,262. The highest values are shown by the porcelain tiles, either white or colored by means of various oxides. The sandblast or some sort of abrasion test might likewise be of service. The ball impact test can be made to give interesting data.

WALL TILES

The principal consideration in glazed wall tiles is the freedom of the glazed surface from crazing or a tendency to shatter. By boiling the tiles in a saturated solution of common salt for three hours, the crazing difficulty is emphasized, and checking of the glaze occurs if a strain between body and surface exists.

ROOFING TILES

Specifications for this material do not exist, but it is evident that good tiles should be able to stand up in the freezing test. Absorption limits cannot be given, as there are on the market both well-vitrified and rather porous tiles which seem to have stood up quite satisfactorily. On general principles, the hard-burned variety is to be preferred.

GLAZED AND ENAMELED BRICK

High grade brick of this kind should possess a hard glaze or enamel, matured not lower than pyrometric cone No. 3. Soft lead glazes are not satisfactory for exposure to the atmosphere. The clay should be burned to an absorption of not more than 8 per cent. The brick, on being subjected to the freezing test, should show no evidence of disintegration. The glaze should be practically insoluble in hot 10% hydrochloric acid solution. In regard to the modern demand for more and more aseptic conditions, the glazed surfaces of this kind of product offer a satisfactory solution.

SANITARY WARE

The plumbing fixtures included in this class of ware consist of two classes, one made of a vitrified porcelain body and another of a porous fire-clay body.

It is evident that the former class represents a more valuable product, since chipping would not expose an absorbent fracture. No specific requirements exist for these products, excepting that the vitreous body must show practically no absorption, and that the glaze should be free from crazing and similar defects.

Within the scope of this paper, all clay products entering into engineering could not be discussed . Such materials as electrical insulators have not been considered, as this was not possible without unduly enlarging the volume of this contribution.

Clay products have not, in the past, received the attention from engineers and investigators which their importance deserves. It would be well worth while if more consideration were given this subject in the curriculum of the architectural and engineering departments of our colleges. This would assist greatly in enlarging the incomplete store of data now available.

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*Gilbert Rigg, Jour. Ind. and Eng. Chemistry, 5, No. 7.

†Stahl und Eisen, 34, p. 832. Also Mitteilungen aus dem Kgl. Materialspruefungsamt. Berlin, 1914, Nos. 2 and 3.

**Trans. English Ceramic Soc., 12, part II, p. 279.

††Bureau of Standards, Technologic Paper No. 7.

†††Tran. Am. Ceramic Soc., 14, p. 470.

*Trans. Am. Cer. Soc., 15, p. 233.

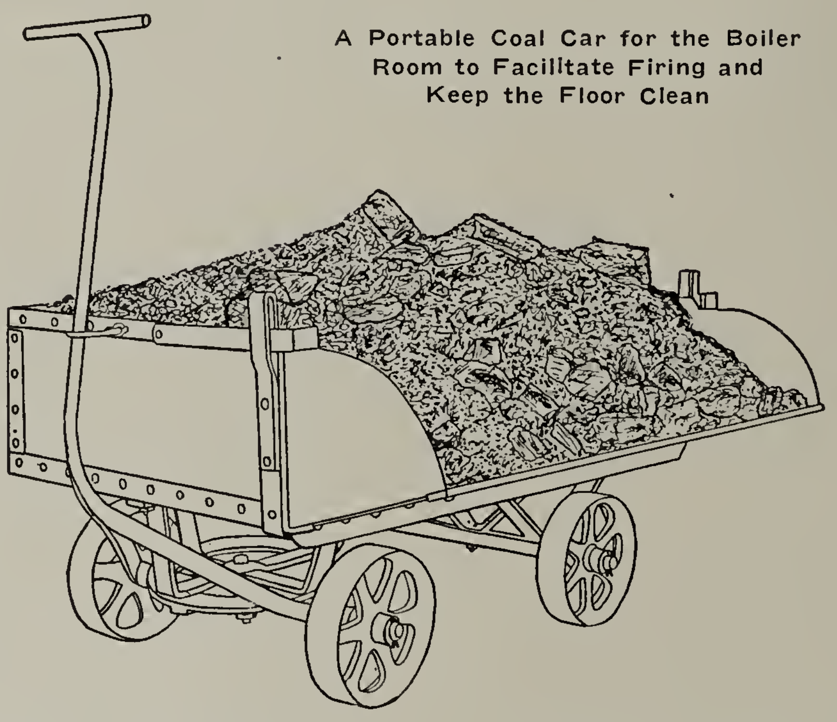
The SUPERINTENDENT

Helpful Hints for Practical Men Whose Problem is Maximum Production With Minimum Cost. Items Treating on Any Phase of Clayworking, from Pit to Loading Truck, Will be Gratefully Received and Published if Found Worthy

WHEN a day's supply of coal is dumped upon the floor of the boiler room to be thrown from there into the furnace, a considerable waste of time and motion upon the part of the fireman, and of coal, takes place. The coal dropped from the fireman's shovel in traversing the distance between the coal pile and the furnace door not only makes the room look untidy but makes it harder for him to walk around and attend to his furnace.

Where the room is small and the coal is dumped in on the floor, while it may be nearer the furnace door, it does not make for efficient firing. Then there is not enough foot room for the fireman to stand in a good position so that he can see the surface of the fuel bed and place the coal where it is needed. With such conditions economical firing is out of the question.

Portable coal cars for the boiler room will facilitate firing and keep the floor clean. A clean and orderly plant is more easily kept to a high point of efficiency than one which is littered with the materials used therein. This applies to the boiler room as well as to any other department. A car with a capacity of about one thousand pounds will, as a rule, give the best service. In some cases, rails can be laid from the storage pile to the front of the boilers on which the car can operate. Where this is impractical, wide-faced wheels may be provided which will run easily over a smooth-laid brick floor.



A Portable Coal Car for the Boiler Room to Facilitate Firing and Keep the Floor Clean

Such a coal car is shown in the accompanying illustration. One side is hinged so that it can be swung level with the car bottom to facilitate shoveling from it. There are no protruding rivets, bolts or edges on this car to delay the fireman in taking coal upon his shovel. Thus he keeps the fire door open a shorter period than if he were bumping his shovel against obstructions on the car, or carrying coal from a distant pile. Wide open fire doors always hinder good efficiency, and the time fire doors remain open should be reduced to a minimum.

Saving Power on Large Machines

The main advantages claimed for the individual motor are better light, more overhead space, the machine's independence of other tools and its consequent flexibility, and an absence of loss from the belt slipping and stalling the tool. Also, if necessary, the machine can be moved more quickly and at less expense than when the power comes from an overhead shaft drive.

Power is saved with a directly geared motor by the absence of slip, and time is saved by the ability to start it from several points, if so desired, by a system of remote control. However, a maximum of efficiency can only be obtained by the proper relation of motor and machine gained from a knowledge of the power required. The right sized motor will operate at a maximum of economy at ordinary loads, and will not stall, but will meet heavy demands without appreciable loss in efficiency. This results in continuous and uninterrupted production.

It should, however, be borne in mind that the overload capacity varies with the time and cycle of demand. For instance, if this overload is to be continuous for several hours it is not advisable to exceed twenty-five per cent overload, but if the demand is intermittent and only of a minute or less in duration, then the overload factor may be much greater.

The proper size motor has an important bearing on investment and operating costs. In order properly to determine the size it is necessary to know the power required and the characteristics of the tool.

A large and ponderous machine will often take a small portion of full current to operate, as it is usually started without load, and has a flywheel which carries it past its cycle of demand with little extra effort of the motor. On the other hand, a small machine with a steady load will consume practically full power. If a motor is too large, its output will not justify its cost; if it is too small, it may burn out or slow up, with a consequent resultant loss in production. In all individual motor drives, the motor, gears and switch should be properly guarded to protect the operator. This is more easily accomplished when directly connected than with other methods of drive.—"Factory."

Periodic Inspection Will Insure Better Belts

A good way to eliminate expensive delays on account of broken belts and to save money in belt repairs and replacements, is to make a regular inspection tour of the plant, examining each belt carefully.

To see that the belts are in proper shape their inspection should be made with a view to ascertaining whether any lap-joints have begun to open, or if the belt is so slack that it is slipping, and that too much oil was not applied at the last dressing.

Also, it is well to see if the belt is in such a condition that it may soon dry and crack, due to lack of oil, and, finally, that the shafting and pulleys are in line so the belt will run true.

If the belt will probably soon need replacing because of its being badly worn, a notation made of the fact, and more rigid and more frequent inspections made it will save money in the long run.

A Concrete Drier Roof That Leaked

This is a story about a clay products manufacturer who used concrete for the roof on his new drier and who, six months later, wished he had used something better able to keep out the water.

The waste heat drier, the roof of which is shown in the accompanying illustration, was built on a clay plant in the Middle West. A six-inch slab of reinforced concrete constituted the original covering, but it was soon found that this roof leaked and spoiled ware in the drier below.

The Roof After It Was Covered with Felt, Hot Pitch and Gravel

The superintendent of the plant quickly decided that this state of affairs could not last, and accordingly proceeded to lay a new roof. The concrete was not removed but a coat of hot pitch was spread over it. On top of this were laid two layers of roofing felt so lapped as to make ten inch faces. Pitch was then spread over the felt and sprinkled with gravel.

The new roof put an immediate stop to all trouble from leaks. It has now been in service for three years and has proven entirely satisfactory.

Moral: Why use concrete where burned clay better serves the purpose and never use concrete in a drier, on general principles.

"Safety First" in Thawing Dynamite

Dynamite is used on so many clayworking plants that any information which will make for safer handling will be valuable reading for those who have the lives and well-being of their men in charge. A writer in the "Du Pont Magazine" has this to say:

The following is the method which I have used in thawing frozen dynamite during the past ten years, and I thought I should like to give others the benefit of my experience, hoping that it will be helpful to them when next they find it necessary to do any blasting in cold weather.

The first thing to do is to find an old barrel of some kind, and to bore one or two ½-in. auger holes in the bottom. Next, place a little straw, hay, sawdust, or anything that will allow water to easily filter thru it, and put it in the barrel to a depth of two or three inches.

Then, secure an old oil can, capable of holding at least five gallons of water—a round can is preferable, because it is more convenient to pack the dynamite around it. This can should have a closed top. Fill the can with boiling water, and place it in the center of the barrel on top of the straw, or hay, or sawdust filling.

The purpose of the ½ in. auger holes is to allow any water that may be accidentally spilled, to drain out. In filling the can with the boiling water, it is a good idea to leave an air-space of at least 1½ in. for the steam that will arise.

In case the weather is not very cold, I would suggest that the can be wrapped in a burlap or other cloth sack, to prevent the dynamite's coming into direct contact with the heated can.

This outfit now represents a very good and economical thawing kettle. Place the dynamite around the can in such a manner that will allow the heat to circulate about the cartridges easily. After a sufficient quantity is thus placed, fill the rest of the barrel with sacks or anything that might be convenient, and which would retain the heat. In case of rainy weather, cover the barrel to keep the water out, and if a strong wind be blowing, place the barrel in a place where the wind will not strike it. If the weather is exceedingly cold, sink the barrel in the ground. In this way the dynamite will keep in good shape for at least 48 hours, if necessary.

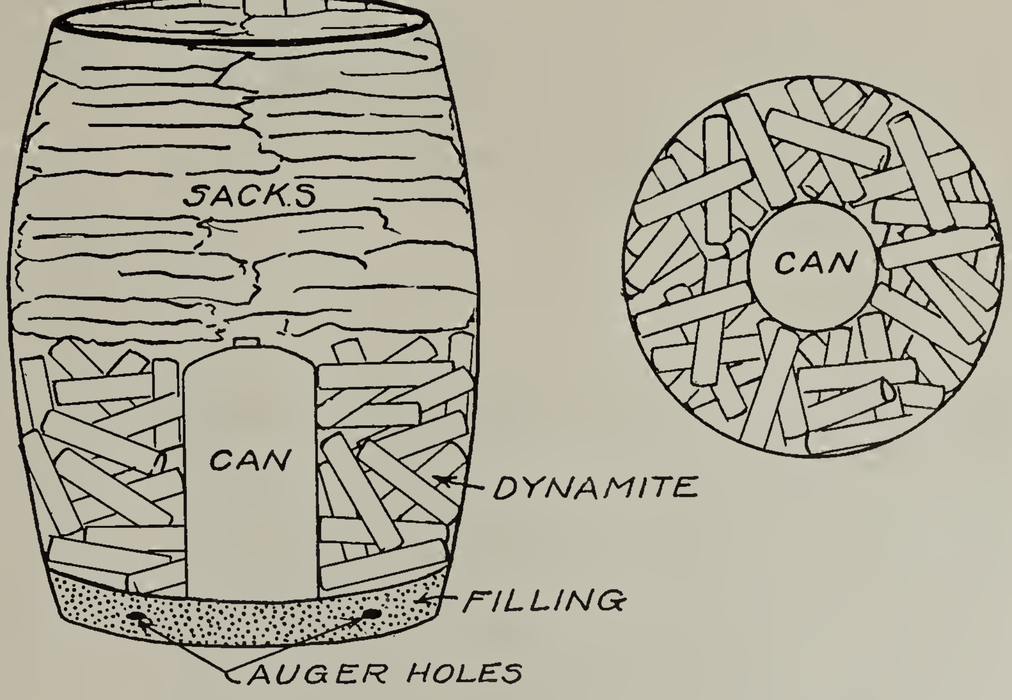
A five-gallon can of boiling water is sufficient to thaw at least 50 pounds of dynamite, but should a person require a larger quantity, a 10-gallon can of boiling water is better.

This plan of thawing has been proven to be a safe method, for the reason that it requires 356° F. to explode pure nitroglycerin, while by this method it is impossible for the heat to exceed 212° F. Tests that have been made have shown the highest temperature in the barrel not to exceed 80°.

Helping the Sales Department

Some time since, the superintendent of one of the best known clayworking plants on the continent found it necessary to build a retaining wall at either side of a driveway that led across the loading track. The grade at the highest point was exactly the height that the floor of a box car is above the level of the track upon which the car runs.

Now there had been a great deal of controversy in the sales department as to the color of mortar best suited to bring out the fine points of the face-brick made at this plant, and a great deal more as to the way that mortar would look after it and the brick had been exposed to the weather.



Simple Equipment for the Safe Thawing of Dynamite

There was also a great difference of opinion as to the proper proportions of cement and lime and sand that should be used.

So the superintendent decided to lay up those retaining walls with the exact variation in color that the yard could

(*Continued on Page 250*)

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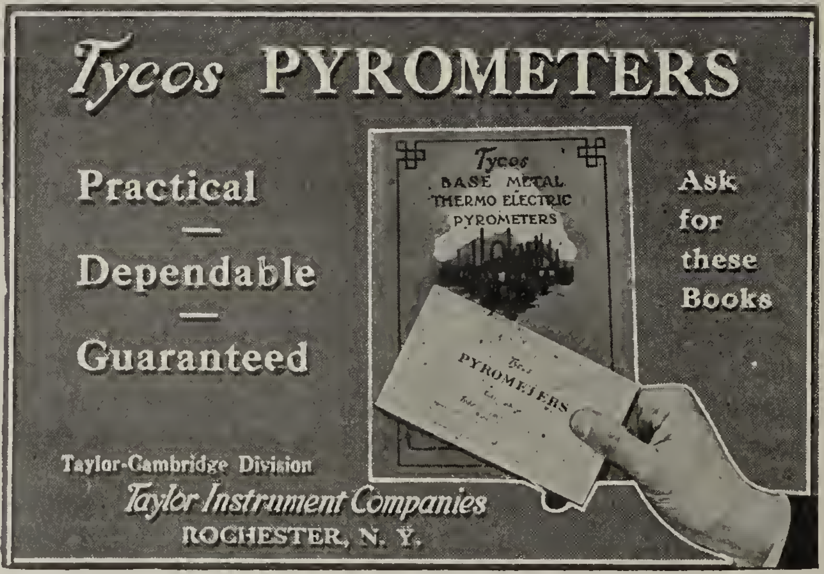

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Burning Brick in Scove Kilns

738. *Virginia—We are anxious to get some information on the subject of burning costs, in connection with soft-mud brick burned in scove kilns. Have you any figures that would be of value to us, in making comparisons on our cost with that of others?*

Reliable figures on any individual point in the process of brickmaking are not at all easy to obtain. The reason for this is, that an average of many yards in one district must be obtained, in order that the high and low costs may be absorbed. Then there is always present the fact that many brickmakers include items that others do not include, but which these same "others" pay for, just the same.

A man who has observed the conditions in the Hudson River yards in New York, and whose figures are believed to be authentic, states that the average cost of burning brick in the general run of plants in that district, from the clay bank to the burned brick standing in the kiln, is $2.65 per M. He adds the information that the average brickmaking season is 200 days, from which must be deducted the days of heavy rain. Each machine averages 25,000 brick per day, and while the smaller plants have but one machine, the larger ones have as high as twenty-four, which is the maximum.

How this cost is made up is described in an article which appears on another page of this issue of "Brick and Clay Record."

The Effect of Mine Water on Finished Ware

740. *Pennsylvania—Will water that is pumped from a clay or coal mine contain detrimental coloring matter, vegetable or mineral matter in solution or suspension that will have a scumming effect upon the finished product, if such water is used in pugging the clay?*

Answering with "Safety First" in view, we would say "Yes." On second thought, the answer would be "Maybe yes, and maybe no—it depends upon the water."

A great deal of the water that is pumped from coal mines contains sulphur. Where the clay contains lime, and is burned with coal that contains sulphur, the action of the sulphur in the coal develops sulphate of lime scum.

If you add sulphur to your clay by pugging it with water that is high in sulphur, it would, at least in theory, leave some of this sulphur in the ware after the greater part of the moisture had been expelled in the drier. There is every reason to believe that this sulphur would act upon the lime content in the clay as soon as the temperature in the kiln reached a point where this sulphur was fused.

There is a fine point here—one which we would like to have discussed by some of the "ceramic doctors" who have

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a liking for these theoretical questions. Not that this is altogether theoretical, for our Pennsylvania correspondent can save money by using his mine water—that is, if he does not lose money by using it.

Charles F. Binns, of Alfred University, in an article which appeared in "Brick and Clay Record" in November, 1913, had this to say:

"Another source of soluble salts is the water itself. Very few natural waters are free from lime salts held in solution. The most troublesome is this same sulphate, but if the "sulphate water" is used, the lime may be in the clay and the sulphur in the water.

"Here is the simplest test for the water: Take a clean glass vessel—a tumbler will do—and fill it with water. If the water is at all muddy, it should be strained thru blotting paper or a piece of fine mesh fabric. Procure a small quantity of chloride of barium, which is a crystalline salt, soluble in water. Drop a crystal or two into the tumbler containing the water to be tested and stir with a clean pencil or paper-knife. If a slight milky cloud forms in the water, it shows the presence of sulphur. This is a source of danger, because the clay probably contains lime already."

The Preparation of Silica Sand

739. *Ontario—We would like to find out how silica sand is procured. We understand there is a process of washing in connection with the preparation for the market. Can you direct me to a source of information, in case you have nothing on the subject in your offices?*

There are several ways in which silica sand is prepared for the market, and among them is the washing process. We regret our inability to furnish much information on this point, but believe that there are manufacturers of sand washing machinery among our advertisers who will be glad to give this subscriber the information he wants.

One process with which we are familiar, however, is that of crushing sandstone between rolls, and then drying and screening it. As it passes over the screens, it is brought into contact with strong air-currents, induced by rapidly revolving fans. These blow out (or suck in) the so-called alumina dust, which is the clay-like substance that binds the "berry of the rock" together.

If any of our readers are in a position to give a reasonably enlightening description of the washing process, we will be glad to forward it to our Canadian correspondent.

Burning Natural Gas in Down Draft Kilns

741. *Texas—Can you inform me where I can obtain literature on the burning of natural gas in down-draft kilns?*

While there has been a great deal published regarding the

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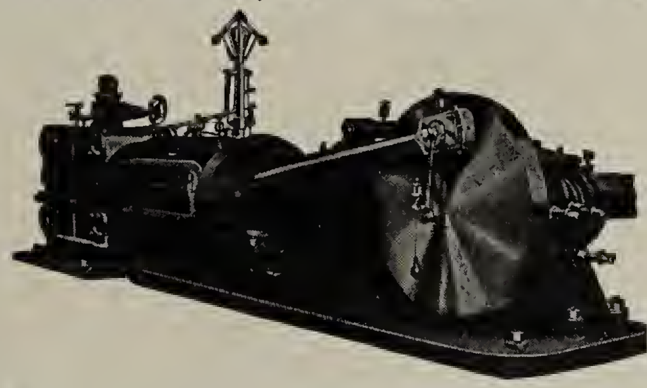

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They cut every kind and class of wet clay ware. Face, common and paving brick. Sewer pipe, tile conduit and fireproofing.

STRENGTH UNIFORMITY DURABILITY REG. U.S. PAT. OFF.

They screen clay, shales and grog. Webb Wires are small and tough, cut clean and leave no ragged edges. They don't break.

THE WEBB WIRE WORKS, New Brunswick, N. J.

With your Shovel ?
In a hurry ? Must have clay ?
The Beam swings and drops,
Rips and rams
For dipper load—
Swings back—then dumps—

and the chains—"They will not break"
if they're WOODHOUSE SPECIALS
We ll tell you why.
WOODHOUSE CHAIN WORKS Trenton, N. J.

PERFORATED METAL SCREENS

As required for BRICK MAKERS USES.

PERFORATED SHEET METALS OF EVERY DESCRIPTION
HENDRICK MANUFACTURING CO.
CARBONDALE, PENNA.

New York Office
Room 524 Cortlandt Building

Manufactured by
HENDRICK MFG. CO.
CARBONDALE, PA.

use of producer-gas, the articles being written for the most part by engineers connected with concerns making and selling gas-producers and producer-gas burning systems, very little has been written regarding the burning of natural gas, for obvious reasons. Then, again, it may be that the operation is so simple that no one has thought it worth while to write anything on the subject. Wherever natural gas has been used in either the up-draft or down-draft kiln, it has proved itself to be the cheapest and most efficient fuel that can be used.

The installation is very simple, the gas merely being piped around each kiln and a burner connected at each fire-box. The burners are each regulated by a valve, so that absolutely positive results are obtained. The operation is as simple as using a gas-stove to cook a meal, the gas being lighted and the volume increased as the heat is required. The plants in Kansas that are using natural gas, as well as those in Oklahoma and northern Texas, are fairly easy to reach, and as there is no secret process nor red-tape to be overcome, it would be well to take a trip that will cover one or more of these plants.

Seeing the operation is much better than trying to acquire knowledge from some one's description.

Who Manufactures the "Ajax" Sewer Block?

735. *Quebec—Kindly advise us who are the manufacturers of "Ajax" segmental sewer block. This block is not manufactured by the American Sewer Pipe Company but by some other concern in the United States and is entirely different from the "Amco" product. If you can help us in this request we will be very thankful.*

If any of our subscribers know who manufactures the segmental sewer block which is sold under the trade name "Ajax", we will be very glad to have them write us, giving us the information. This is another instance of the value of the directory of trade names which is published in every issue of "Brick and Clay Record." It is not necessary to preach a long sermon upon this point but here is an instance of a prospective buyer who wishes to procure a certain branded article. If he fails to find it, he will be compelled to accept a substitute. If the name were listed in "Brick and Clay Record's" directory of trade names, there is little doubt but that a sale of this material would be effected by mail and that the profit on the transaction would be many times the amount charged for listing the trade name.

(*Continued from Page* 247)

serve with the least amount of trouble. And, since he had some ideas regarding mortar color, he did some experimenting.

He "backed up" his walls with hollow-tile, as a precaution against water-pressure and he also laid a tar-paper on the cement foundation. That protected his brickwork against the moisture that would arise thru capilliary attraction.

He kept an accurate record of the amount of sand and lime and cement and mortar-color that was used, and in some cases did away with cement altogether.

The yard looks better than it did before he built the walls, and the face-brick "panels" have grown rich in color, as the brick have blended with the mortar joints. Architects are specifying the brick, and asking that it be shipped with the same proportions of lights, darks and intermediates as were used in the "panels." They also ask for the "right dope" on the mortar.

This superintendent wasn't afraid to subject his brick to the ultimate test—and his judgment has proved sound.

(*Continued from page* 240)

the City of Minneapolis. In the evening the banquet was held.

On Friday morning, January 21, in addition to dispatching certain unfinished business of the convention, one paper was read—that of Murray B. Grover, of Minneapolis, Minn., on "Coal—When and Why."

At luncheon on this day members of the association were the guests of the Minneapolis Civic and Commerce Association at which the Hon. William C. Redfield, Secretary of Foreign and Domestic Commerce gave an address, taking as his topic the foreign trade situation and the work of his department in connection therewith. Mr. Redfield mentioned the progress that was being made in the substitution of domestic clays for those formerly imported and used in the manufacture of clay products. His talk was very interesting, giving a clear, concise and complete explanation of the foreign trade situation to which so much attention is now being given in all branches of industry.

On Friday afternoon, the annual election of officers was held, resulting as follows: B. Frank Pay of Mankato, president; L. G. Rose of Minneapolis, vice-president, and R. H. Smith of Minneapolis, secretary and treasurer. Following the election, came the discussion of problems found in the "Question Box," which, as usual, proved very helpful.

While much was to be desired in the way of a larger attendance—about forty were present—the convention was eminently successful in view of what was accomplished. The treasury showed a substantial balance. Altogether the efforts of the retiring president, F. B. Martin, and secretary and treasurer, L. G. Rose, were not without results.

Imported Tile

A subscriber writes that if any dealers or users of glazed tile such as were formerly furnished by the Belgian Tile Works at Hasirre near Tournai, at Orp le Grand, and Dubris of Enghien and Ennuyere, that exactly the same product is manufactured at the tile works of Nord and of Pas-de-Calais at Watten (Nord), France, and that there is no difficulty in securing prompt shipments from that point. Deliveries of these tile are now being made in Porto Rico and have been very satisfactory, little difficulty being experienced in getting transatlantic carriers.

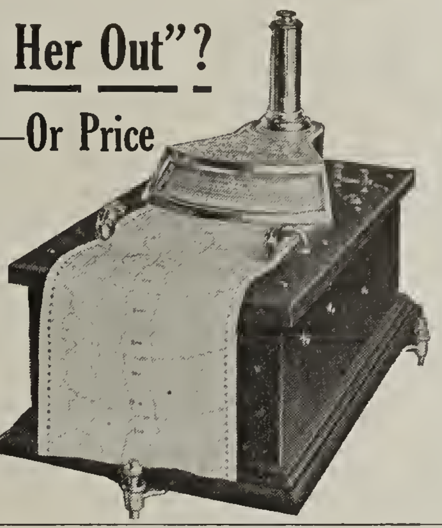
A Correction

In the January 18 issue of "Brick and Clay Record" two illustrations were shown of the offices of the Pearson Brick Company, and by error, the address of the company was given as Beaver Falls, Pa. Our attention has been called to the fact that the Pearson Brick Company's very handsome exhibit rooms are located at New Castle, Pa., and for that reason this correction is made.

"Buying Well"—

a series of stories from real life, and illustrating the fallacy of buying "cheap" machinery—or, for that matter, men—is omitted from this issue of "Brick and Clay Record." Not that we have run out of material, but because we need that letter you ought to write—telling us

The Mistake You Made!



"When Do You Put Her Out"?

Guess At It—Time Limit—Or Price

Do you know positively when your kiln has reached and sustained for a sufficient length of time—a maturing temperature?

A Price Pyrometer furnishes absolute information.

The Price Electric Co.
12367 Euclid Ave.
Cleveland, Ohio

IT SAVES ITS COST WITH ONE CATCH

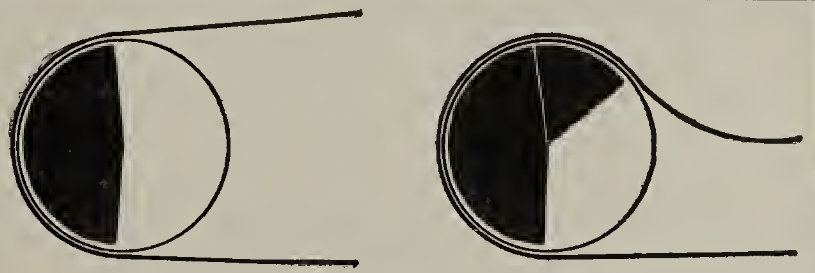
In making it possible to discover on time each—and every fire, in preventing theft, vandalism—and sleep—in reducing your fire insurance.

Hardinge Watchman's Clock

pays its own purchase cost in short order, and can save by prevention as outlined above, thousands of dollars. Let's talk it over.

HARDINGE BROS., Inc.
1760 Berteau Ave., Chicago, Ill.

Approved by National Board of Fire Underwriters.



Contacts Increased
Belt Slack and No Slip

Cling-Surface is a belt food that promotes long and economical belt life as well as constant high transmission efficiency, and offers about the best paying investment any belt owner can make. Order a package today for trial. Literature on request.

CLING-SURFACE CO 1029 Niagara St Buffalo N Y

"The Tanks with a Reputation"

Hoop Lugs made by Caldwell

will never slip or give way. They are the only "positive grip" lugs on the market. This lug does not depend on friction to hold it, as other lugs do.

Our catalogue of Tanks and Hoop Lugs, contains illustrations giving full details. Let us send you a copy and make you prices.

We can ship promptly.

W. E. CALDWELL CO., Inc. Louisville, Ky.

Tanks (*Steel-Wood*) Towers
(*Galvanized*)
Wind Mills—Pumps—Gas Engines

SAY!

Are you using ***Nugget Babbit?***

WELL — WHY NOT? —

It's the best—its hardness insures great wear resistance—it stands up under heavy duty—over one hundred other plants stock it—and use it.

What's your address?

THE CLEVELAND ALLOYS CO.
CLEVELAND - - - - - OHIO

Drier Doors That Hold the Heat

No matter what type drier you have, you need to equip it with the

"Carrier" with One Door Lifted.

Perfected Dry Kiln Door Carrier

Doors can't warp or get out of shape—easy to operate—only one carrier needed for each battery of doors.

Made for doors from 2' to 8' wide and 5' to 8' high. Made for wood or fireproof construction.

Write for catalog B2 and all details.

Sold on 60-day trial.

Dry Kiln Door Carrier Co.
Indianapolis, Indiana

THE IMPORTANCE OF DRAFT CONTROL IN BURNING

Cannot be overestimated. For many years we have made the

Best Draft Gages for Kilns.

The Ceramic Supply & Construction Co.
COLUMBUS - - OHIO

Do You Need Dryer Cars?

Cars that are built heavy and strong—cars that will not warp—cars that will resist for years an alternation of low, wet heats and high, dry heats—cars that will stand rough handling—that only need oil to keep them moving, and bearing full loads, season after season. We have such cars and on these cars we guarantee satisfactory service, and on our Special Cars, Turntables, Grate Bars and Grey Iron Castings.

Pettigrew Foundry Co.
Harvey, Illinois

The SALES-

Short Stories That May Help the Salesman Who Aspires to Salesmanagership and the Salesmanager Who Wishes to Retain His Ability to Close Big Deals

Whenever the secretary of any association of burned clay manufacturers runs out of subjects for convention papers, he chooses "What's the Matter with the Drain Tile Business,"—or common-brick business, or sewer-pipe business, or face-brick. As a result, the man chosen to deliver the paper answers the question by saying that there is nothing the matter—that the business is all right—that it is getting better all the time, and that, if this and that and something else could be remedied, the working day of every man connected with that particular kind of clayworking would be one great song.

Not long since the writer of this sermonette had the pleasure of listening to a speaker who asked himself, "What's the Matter with the Face-Brick Business?" He answered by declaring that the invasion of the rough-face face-brick was not to blame—in fact, "rugs" and similar textures had helped to improve the business. Nor was it overproduction, as had been claimed—but low prices. He said that there ought to be a way of legally getting together and setting some minimum price, at least, and that any brick sold for facing purposes ought to be sold at that price or better.

And, so, having occupied a prominent position for a quarter of an hour, he sat him down, the while a complimentary ripple of applause stirred the smoke-rings that came from forty or more cigars.

You will remember what the poet said about the lightning bug. It goes something like this:

> "The lightning-bug is brilliant,
> But he hasn't any mind;
> He blunders thru existence
> With his head-light on behind."

The one thing that is the "matter" with the face-brick business is poor salesmanship. Or, to express it better, poor salesmanagership.

There are more positions open, and at attractive salaries, than there are good face-brick salesmen to fill them.

The sales managers are educating a lot of otherwise good salesmen to be price-makers instead of order-makers.

"Knowledge of costs" will never help prices. Someone else will always believe that he can make brick cheaper than you know you can make them.

"Knowledge of costs" will not develop a sales argument. Knowledge that a price can be "shaved" will crowd out a whole lot of knowledge as to why that particular brick is better for the purpose for which it is offered, than any other brick, irrespective of price.

Which way are you training your men? Which way are you training yourself?

Selling Drain Tile to Farmers

Did you ever think, when you were recommending the use of drain-tile, that to get the water off and out of the ground was not the sole mission of drainage? The exact benefit

MANAGER

If These Stories Help You, Let Some of the "Bigness" That Has Made You a Successful Salesman Cause You to Write Us One Selling Letter

is a much more elaborate combination than just merely removing the water.

Rainfall is going to do one of a very few things, after it comes down; it is either going to run off the land, and probably carry some of the best soil with it, washing gullies and ditches, and sink into the ground, to be carried off as ground water (which is a slow proposition) or evaporate, which is a much slower proposition.

Or it may stand on the ground for months and years, as is the case in a swamp, or a pond, or a lake.

With reference to evaporation, if you will blow your breath across the back of your hand, your mouth being wide open, the sensation will be that of warmth. If, however, you moisten the back of your hand with your tongue and then repeat the blowing performance, the sensation will be that of chill. Now there is no difference in the temperature of the breath—the chill is due to the evaporation of the moisture.

This truth can be applied to the seed bed; if the wind has to carry off a large amount of moisture, the temperature of that seed bed is going to be low and that low temperature is going to continue low—much longer than it would, were the water carried downward, as it is in ground that is well under-drained.

Getting into the field and getting it planted, and having the temperature at a sprouting point earlier in the spring would alone make it worth a farmer's while to drain his land with good clay drain-tile.

Then, after the seed has sprouted, the higher the temperature of the ground, the less active the wire-worms. That is worth remembering.

Once the crop is up, if it be a crop that must be cultivated, another problem often arises. It is whether it will do the crop more harm than good to go in and plow with the ground in soggy condition. Soil that is worked when it is muddy soon locks up its humus and becomes permanently cold. On the other hand, land that is well tiled gives a farmer more time to get into the field between rains, and keep the weeds down.

Try these arguments the next time you find yourself across a fence from a farmer. Show him that you know something about his business—farming. You want him to know something about drain-tile—in fact, you expect him to.

The Importance of Freight Rate Data

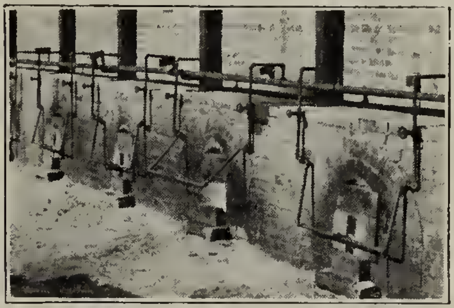
A salesmanager who is not a freight expert will do well to qualify in that direction at the earliest possible moment. Or, if the magnitude of the output or distribution be such as to permit of the extra name on the pay-roll, to employ someone who has made a study of transportation.

Many cases of lost business can be traced to lack of this knowledge. It may be that you are figuring your freight rate entirely too high—that by routing your shipments somewhat differently, a lower rate would be obtained. In this, the local freight agent is far from being an accurate advisor. Too high a freight rate added to your cost of production and the profit that you believe necessary to show a good mar-

Investigate Our Line

Dies for Clay Working, our Specialty. Brick, Fireproofing, Plain and Ornamental Hollow Ware Dies, for Auger or Steam Press; Piano Wire Clay and Sand Screens, Conveyors, Elevators, Dry Pan and Pug Mill Automatic Clay Feeders, Friction Winding Drums.

The Louisville Machine Company
Louisville, Ohio
Patentees of *The Roller Process Paving Block System*

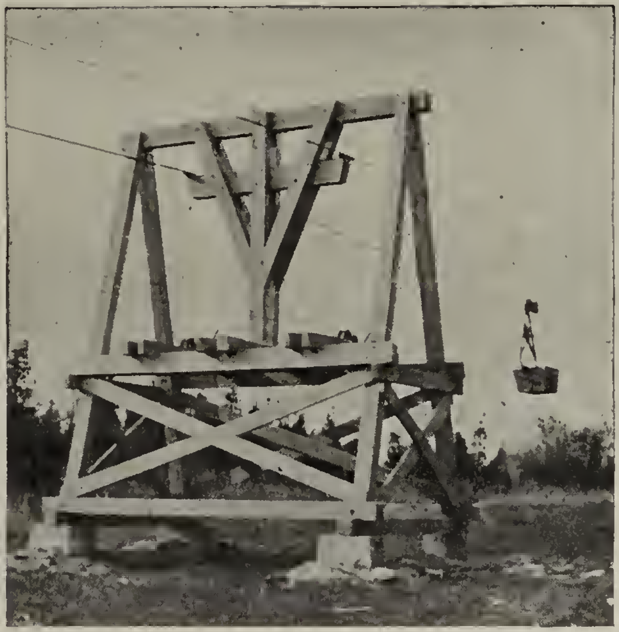


FOR
QUICK BURNS
AND
BETTER BRICK
WITH
LESS OIL
USE THE
SCHURS

Over 20,000 In Use
Write Us

SCHURS OIL BURNER CO.
LOS ANGELES CAL., U. S. A.

If the Grade is Sufficient—Gravity Supplies All of the Power



B. & B. Friction Grip Aerial Tramway
requires only one man to operate it, will work regardless of bad weather, any capacity desired. It is perfect in construction, simple to operate, maintenance cost is low. Outline your haulage conditions and we will gladly estimate the cost and possible savings to you.
Ask for Catalog No. 16.

BRODERICK & BASCOM ROPE CO.
New York ST. LOUIS, MO. Seattle

"CAN'T BE BEAT"

Why did a clay manufacturer tell us that about his MARION Revolving Shovel? *Because* it was giving him satisfaction, *because* it was making him a greater profit and *because* it was saving him from worry and inconvenience with labor conditions. There's a MARION to help *you*, too, Mr. Clay Manufacturer—no matter what your capacity may be. There's a MARION that will give you *Constant Service*—better, quicker and more profitable results. Write for Catalog 92—it tells a story of interest to the Brick Man.

THE MARION STEAM SHOVEL CO.
[ESTABLISHED 1884]
Station A. MARION, OHIO

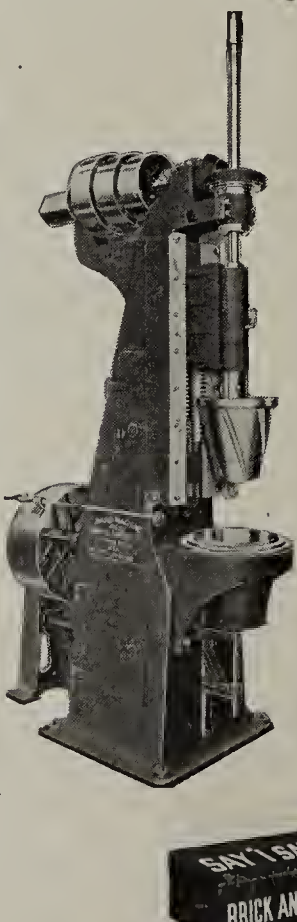
Flower Pots—

A Profitable Bi-Product

No matter what the nature of your clayworking plant, it is no doubt possible for you to add Flower Pot manufacturing with very little additional outlay.

Often you wish you had some way to keep Jim Smith or Jack Jones busy all the time, don't you? Well, here's the solution: put in a

Baird
Flower Pot Machine



Easy to operate, absolutely accurate. Makes any regular size pot desired.

Send us a sample of your clay and let us show you what our machine will do.

Baird
Machine & Mfg. Co.
54-56 Jefferson Ave.
Detroit, Mich.

gin for your department, may cause you to lose business that otherwise would be yours.

At the same time, the prices that are quoted by competitors shipping from points that are, or are not, on the same rate basis as yours, may carry a much better margin than you are led to believe, simply because the man in charge of that plant's sales has a better knowledge of transportation than you have.

Every time you lose an order, it is well to find out who secured it, and why. Do not take too large a dose of the soothing syrup that is labeled "He is a Price Cutter." Find out what he actually paid the railroad company that transported his material to the point where it beat you out of a desirable contract.

(*Continued from page* 228)

ington, D. C.

"The Burning Question"—Anton Vogt, Troy, N. Y.

"As Others See Us"—Wm. G. Rose, Cleveland, Ohio.

Other subjects will be considered informally, and members desiring information on any particular phase of the business are requested to make their wishes known to the secretary, Theodore A. Randall, of Indianapolis, Ind., and an effort will be made to have the subjects suggested given considerate attention.

Convention headquarters will be at the Hotel Statler, where "Brick and Clay Record" will keep "open house" in room 341, extending a hearty welcome to its subscribers, readers and advertisers, present and prospective.

Announcement is also made of the annual convention and election of officers in the American Ceramic Society, which will also be held in Cleveland, the dates being February 21 to 24.

The National Builders' Supply Association will also meet in the same city, its dates being February 21, 22 and 23. This dovetails with the dates of the National Brick Manufacturers' Association, which will open its convention on the 23rd and adjourn on the 25th.

The National Clay Machinery Association will meet at the Hotel Statler, Washington's Birthday, the 22nd.

Altogether, it looks like a gathering of clay manufacturers and allied interests that will be of unusual interest.

(*Continued from page* 234)

F. D. Stone on "Commercial and Manufacturing Costs." Prof. Homer F. Staley, of the Iowa State College, was scheduled to read a paper on "Glazing and Vitrification," but did not arrive in time. However, he satisfied everyone by appearing the next morning and performing his part in the program. In the afternoon of January 19 an inspection tour was made of the campus farm at the state university.

A banquet was held in the evening at the Lindell Hotel, following which Mr. King gave another talk on permanent farm buildings, dwelling somewhat at length upon the work that his society is doing in Iowa.

About forty manufacturers of the state attended the sessions, going away with considerably more value in knowledge and experience than was expended to make the trip. The next meeting of the association will take place at Hastings, Neb., at a date not yet set.

Positions Open
And Positions Wanted. See the Classified Advertisements on Pages 292 and 293.

The Semi-Monthly Trade Review

ANXIETY—not as to the amount of business that will be available when Winter's icy fingers have been forced to loose their grip on building progress by the balmy days of spring—but as to how the flood of orders, already in evidence, can be filled, will be the worry of the brickmaker during 1916. From present indications, the capacity of plants in many sections of the country will be insufficient to take care of the business that will be offered when spring building opens.

In order that an adequate idea may be conveyed of existing conditions in the clayworking industry as regards supply and demand, let us make a tour, in our imagination, of the nation's clay plants and large cities where a greater part of the products are consumed.

Beginning in New England, where for some time previous to the summer of 1915 there had been little evidence of life in the sale of brick, we find an unusual situation. Plants, which usually close late in the fall, have been running at capacity up to the first of the year, extreme cold weather only now having forced the last of these to cease operations. An early resumption of activity at these plants is now being discussed by the manufacturers, who about this time in other years are taking extended vacations with thoughts far from brickmaking. Of course, the building of munition factories has been largely responsible for the existing heavy brick demand in this section, but these are retiring to the background, giving way to peaceful industrial expansion growing out of a restored prosperity which now holds sway.

NEW YORK COMMONS REACH TEN DOLLARS

Jumping down to New York City, we find that for the first time since May, 1906, common-brick has reached the ten-dollar level—a height that was attained during January. It is estimated that not more than three hundred million brick are available in the Hudson River Valley for use between now and spring. In view of this fact, there is little doubt but that, should the present boom in New York building continue, prices will rise to still higher levels and possibly equal that of $11.20 which prevailed ten years ago. The persistent demand has forced a large Staten Island brickyard to operate thus far into the winter, while Raritan River yards in New Jersey are operating on "extra time." Continuing on down the Atlantic seaboard, improvement and a growing activity in building operations is revealed, favorable reports being found in Baltimore, Philadelphia, Washington and even in quiet, quaint Richmond.

Traveling across Pennsylvania, where busy plants are seen on every hand, the Middle West is reached. Cleveland, Cincinnati, Columbus, Dayton and other cities are reporting

BALDWIN

You want a reliable, economical locomotive for service about your plant. Investigate the **Baldwin gasoline locomotive.**

These locomotives are reliable, because they are correctly designed and built. They are economical, because they consume no fuel while standing idle.

Record No. 74, which is yours for the asking, tells all about them.

THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA, PA., U. S. A.

WHATEVER equipment you need—don't buy until you know something about the

Lakewood Line

We Manufacture

Buckets, Kiln Bands, Pressed Steel Brick Pallets, Bearings, Portable Track, Ball Bearing Turntables, Switches, Richardson Double Die Steam Represses, also Miniature Hand Represses.

Cars of all kinds

Every piece of equipment is built of the best material by the best mechanics obtainable. The Lakewood Line is Built to Last.

Ask for Catalog No. 11

Lakewood Engineering Co.
Formerly the Ohio Ceramic Eng. Co. Cleveland, Ohio

LEHIGH PORTLAND CEMENT CO.
LEHIGH
ALLENTOWN, PA.—CHICAGO, ILL.

The Cement for Paving Brick Grout

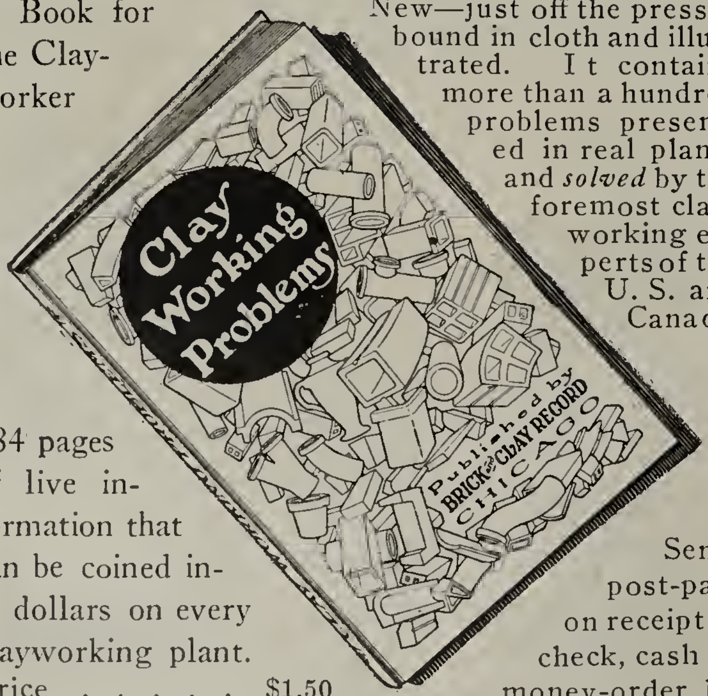
Lehigh is High in Strength, Uniform in Color and Fineness. You Don't Have to Guess with Lehigh.
Specify and Use Lehigh in all Brickwork. Remember the Mortar Joint is an Important Factor in the Wall.
Use Lehigh and Cease to Worry.
It Assures Satisfaction Under All Conditions.

LEHIGH CEMENT
Cement Grout for Permanence

101 Questions Answered

A Book for the Clay-worker

New—just off the press—bound in cloth and illustrated. It contains more than a hundred problems presented in real plants and *solved* by the foremost clay-working experts of the U. S. and Canada.


Clay Working Problems
Published by BRICK & CLAY RECORD CHICAGO

184 pages of live information that can be coined into dollars on every clayworking plant.
Price $1.50

Sent post-paid on receipt of check, cash or money-order by

Brick and Clay Record
445 Plymouth Court CHICAGO

substantial plan filings. Cold weather about the middle of the month and immediately thereafter, put a damper on much of the building under way, resulting in a slowing-down of deliveries, but nearly every brick plant is making preparations to take care of an enormous business when the last cold days are gone. Sales forces are being increased and extensive plant changes are being made to secure additional capacities. Prior to the first of the year, open weather prevailing in many cities gave an impetus to sales which is still being felt. In Detroit, for instance, even with increased capacities, brickmakers have not been able to accumulate stocks for the spring rush, due to a continued winter demand.

CHICAGO PREPARES TO BUILD EXTENSIVELY

While building permits in Chicago for the week ending January 22 were somewhat lower in volume than for the same period last year, due to a cold snap, real estate sales showed a twenty-five per cent gain, which foreshadows extensive building in the spring.

In Minneapolis, St. Paul and thruout the Northwest are found a group of clayworkers waiting in expectancy. The severe winters in this section of the country do not permit of much activity in building, but all signs point to an impending flood of new work just as soon as the backbone of winter is broken. One common-brick plant in Minneapolis, for instance, is making improvements that will increase its capacity to fifty million brick a year in anticipation of a heavy spring and summer demand.

Prospects for a capacity business this year never were equalled, is the message we hear in the Far West and on the Coast. The rainy season in these sections is preventing extensive building construction now. But plan filings are encouraging. Builders are preparing to break away with a rush when spring comes.

Altho many sections of the South have not as yet felt a quickening pulse beat in the arteries of trade, this section as a whole is prosperous, a condition that is being reflected among its brick plants which are making improvements, increasing capacity, and in general preparing for an increase in the amount of building.

ALL BRANCHES OF INDUSTRY PROSPEROUS

While particular stress has been lain upon building brick, in this fortnightly review, mention must be made of a continued activity in the manufacture and sale of fire-brick. It has been said that if any iron or steel plants are idle, it is because of an inability to secure raw materials or men, and not because of any let-up in the demand for these metals. The new furnaces that are constantly being blown in, and the growing demands of oil refineries, gas plants and other industries that use fire-brick, are creating at a market for refractories that has not been equalled in recent years. Many new plants for the manufacture of fire-brick and shapes are being pressed into service. Drain-tile, hollow-tile, sewer-pipe and paving-brick are also coming in for their share of the good times. The pottery industry is booming. Altogether, it seems as tho a very prosperous era is striking the man who has some money invested in a clay bank and molding machinery.

"Buying Well"—

A Series of Stories on The Economy of Buying Well is Omitted From This Issue. It will be Resumed when

You Send in Some More Stories

IN *the* WAKE *of the* NEWS

Being Brief Mention of a Host of Interesting Happenings in the Varied Fields of Clayworking

PERSONAL

Frank S. Wright, junior partner of Meacham and Wright Brick Company with offices in Chicago, died on January 22 after an illness of seven weeks. Mr. Wright was well-known in building material circles, and particularly in the marketing of face-brick, having been associated with Mr. Meacham for more than forty years. He was at one time president of the National Builders' Supply Association.

John F. Sanford has been elected treasurer of the York Harbor Brick Company of York Village, Me., succeeding A. H. Locke. In addition to his other duties, Mr. Sanford will have charge of buying and selling. He reports that it is the intention of his company to make 6,000,000 brick in 1916 as against 2,500,000 in 1915.

A. I. Hunter, who for the past ten years has been president of the Red River Valley Brick Company, Grand Forks, N. D., was presented with a diamond ring by the stockholders of that company at its annual meeting held on January 11 at which Mr. Hunter was re-elected president.

N. Hermes, formerly of Medicine Hat, Alta., has accepted the superintendency of the Muskogee (Okla.) Vitrified Brick Company. This concern is remodeling its plant and installing new machinery, expecting to begin making brick about February 1. The output will be 100,000 brick per day, face-brick, pavers and commons.

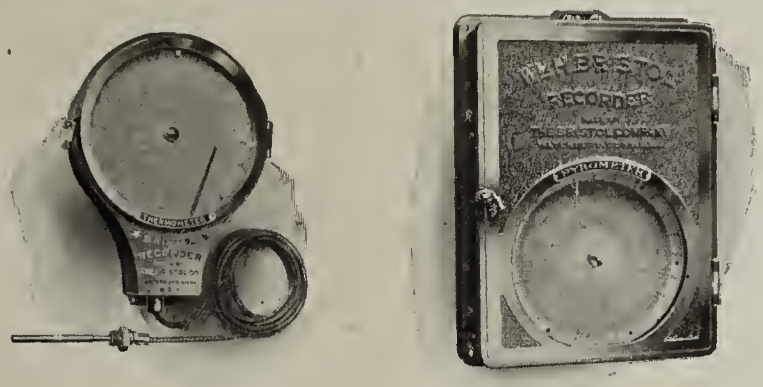
H. P. Harding, formerly secretary and treasurer of the Puritan Brick Company, Detroit, has been transferred to the main office of the company at Hamden, Ohio. Dr. J. W. Morrison is now in charge of the Michigan business, with headquarters at Detroit.

F. C. Prier has been named as manager of the newly formed Cleveland office of the Claycraft Brick Company, Columbus, Ohio. A room—No. 621—in the Garfield Building, Cleveland, has been engaged from which the local business will be transacted.

Charles W. Searight, forty-eight years of age, and manager of the Pittsburgh office of the American Sewer Pipe Company, died on January 24 at the Hotel Savannah, Savannah, Ga.

Harold W. Holmes, formerly general manager of the Puritan Brick Company, of Detroit, Mich., and past president of the American Face Brick Association, has formed a new company, with offices in the Farwell building, where a full line of face-brick and enamels will be carried.

W. T. Mathews, formerly in the building supply business in New York, has joined the sales force of the Claycraft Brick Company, of Columbus, Ohio.



Bristol's Recording Instruments
For Pressure, Temperature, Electricity, etc.
Awarded the Grand Prize
AT THE PANAMA-PACIFIC EXPOSITION

Bristol's Recording Thermometers and Pyrometers used extensively to Control Kiln Temperatures

Bristol's Recording Instruments are unique in their extreme simplicity of construction and are guaranteed for satisfactory service under severe working conditions.

Write for Catalog 1400

THE BRISTOL CO., Waterbury, Conn.
BRANCH OFFICES
BOSTON NEW YORK PITTSBURGH CHICAGO

You Are Judged By the Samples You Send

Have you ever considered this fact, that your sample brick are your representatives, and that your company and its ability to furnish good material in good condition are judged by the condition in which the sample is received?

It costs but little to pack your brick in Hinde & Dauch Corrugated Boxes, but you can be sure they will give thorough protection—no chipped edges or broken corners when these boxes are used. The sample will be a credit—not a disgrace.

Try it for yourself

The Hinde & Dauch Paper Co.
Sandusky, Ohio

LOAD BORE HOLES
With Low-Freezing
DU PONT
Quarry Powder
A New, Powerful, Quick-Acting Explosive
Especially Made for Winter Work

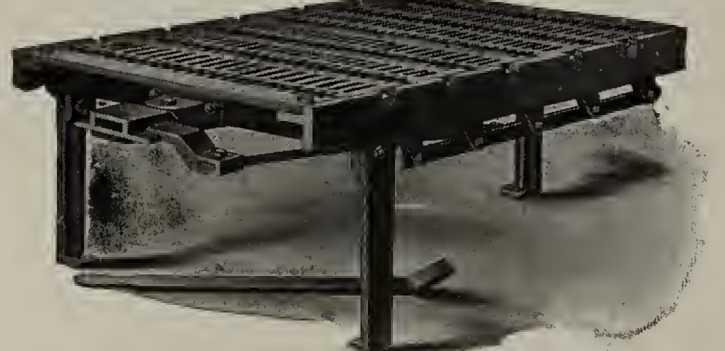
THIS explosive meets the requirements for an "all-round" powder for clay pit work. It has the low-freezing property which makes the thawing of explosives seldom necessary, even in a near zero weather.

Insist that all blasting be done with DU PONT QUARRY POWDER or low-freezing explosives introduced and made by the pioneer powder makers of America.

ASK FOR NEW AND INSTRUCTIVE BOOKLET ABOUT EXPLOSIVES AND METHODS OF USING.

E. I. DU PONT DE NEMOURS & CO.
Powder Makers Since 1802
WILMINGTON, DEL.

PUT THEM IN THIS WINTER



The Canton Kiln Grate

From the time of the first installation in the kilns of the Massillon Stone and Fire Brick Co. of Massillon, O., up to the present time—dozens of sets have been installed—and are giving utmost satisfaction. Get a trial set, and prove with them that you can save over one-fourth of your fuel bill. Put them in just one kiln—their utility and the saving accomplished, convinces that the Canton is the only way.

The Canton Grate Co.
1706 Woodland Ave. CANTON, O.

ARKANSAS

The Pocahontas (Ark.) Brick Manufacturing Company has been organized to manufacture and sell brick. Joseph Baltz, Joseph DeClerk, Joseph Peters, Joseph Schmidt, Jr., and R. A. Roberts are interested parties.

The Benton (Ark.) Brick and Pottery Company reports that, while the demand for brick in that section is rather weak, the stoneware trade is getting brisk. One of the main reasons for this is that retailers have refused to buy for the past two years, consequently their stocks are now very low. Frank H. Bennett, secretary of the company, states that the great wave of prosperity in the southern states has not as yet reached the country around Benton. He does not believe that the demand for brick will show much life for another year. However, a good drain-tile season is anticipated, for which the company is well prepared with a large stock.

CALIFORNIA

Gladding, McBean and Company, San Francisco, who operate a large pottery and terra-cotta plant at Lincoln, Cal., is moving its main office, which for several years has been on the third floor of the Crocker building, to the eleventh or top floor of the same building.

The Steiger Terra Cotta and Pottery Company's plant in South San Francisco, Cal., was busy thruout the holidays and opened the new year with a contract for the terra cotta to be used in the Redding school in San Francisco. A number of other jobs are being figured and the company looks for a prosperous year.

The Valley Brick and Tile Company of Modesta, Cal., is a new corporation with a capital stock of $100,000, the principal stockholders being L. C. Brinkmeyer and George F. Huber of Sacramento. Work on the building of a plant is about to be started on a thirteen-acre tract of land near that city.

Denying a report that the Los Angeles (Cal.) Pressed Brick Company is preparing to move its plant from that city to recently purchased property at Alberhill, the company states that this property will be used mainly for the manufacture of fire-brick, and that no important changes will be made at any of its other plants.

The demand for magnesite from eastern fire-brick manufacturers has led to the extensive development of deposits in California. Large shipments are being made from one point in the coast mountain range between the Santa Clara and San Joaquin valleys, the material being hauled about thirty miles over poor roads in motor trucks. Plans are now under way, to build an industrial railway to the works.

L. A. Steiger, president of the Atlas Paving Brick Company, San Francisco, reports no great paving activity in that city at present because of continued wet weather. Mr. Steiger believes that there is a great future for the paving-brick industry in San Francisco. The present output of this material is limited, being about 150,000 per month. The Atlas Company is getting its shale within the city limits, and its product stands a satisfactory rattler test.

Gladding, McBean & Company, San Francisco, Cal., is still working on its new offices, which, it is planned, will be among the most elaborate on the Coast. Wherever possible burned clay is being used in the decoration of these offices, even to the lobby in front of the elevators, where terra-cotta jars, a terra-cotta garden seat and similar equipment are in evidence. In one of the inner offices a terra-cotta writing table is to be found, while other articles of the same material adorn the room.

The Stockton (Cal.) Fire and Enamel Brick Company is finding its new drier a success, making winter operations profitable. Utilizing the waste heat from the kilns, it saves fuel and also much useless handling and storing of "green" brick for winter burning. This company is experimenting in the manufacture of silica and magnesite brick. Eugene Corrigan, representative of the company in San Francisco, reports an improvement in the demand for clay fire-brick, orders for some grades being taken from points as far distant as Los Angeles.

N. Clark & Sons, San Francisco, Cal., thru their manager, J. R. Gwynn, report that the demand for clay products has been steadily improving. There has been a great deal of figuring on jobs since the first of the year, but it is as yet too wet to make deliveries, this being the rainy season on the Coast. A number of small brick and terra-cotta orders have been booked, the largest of these being for the Alameda county infirmary, in which a considerable quantity of smooth face-brick, terra-cotta and partition tile will be used. The demand for sewer-pipe has also improved, according to Mr. Gwynn, a stiffening of prices being the result. This company is finishing the work on its new display rooms. Revolving cases have been installed, containing panels of face-brick laid up in ornamental bonds.

COLORADO

The Denver (Colo.) Mantle and Tile Company has had several analyses made of clay deposits on the Denver and Intermountain road. It is reported that there is a large quantity of red clay there which has a commercial value. If present plans are carried out, the company will develop these deposits in the near future.

Work has been started on the cleaning up of the ruins at the plant of the Golden-Fairview Pressed Brick Company's plant at Golden, Colo., which was destroyed by fire on December 21, 1915, entailing a loss of about $30,000. It is the intention of the management to erect modern, fireproof plant buildings, which will make a repetition of December's fire impossible.

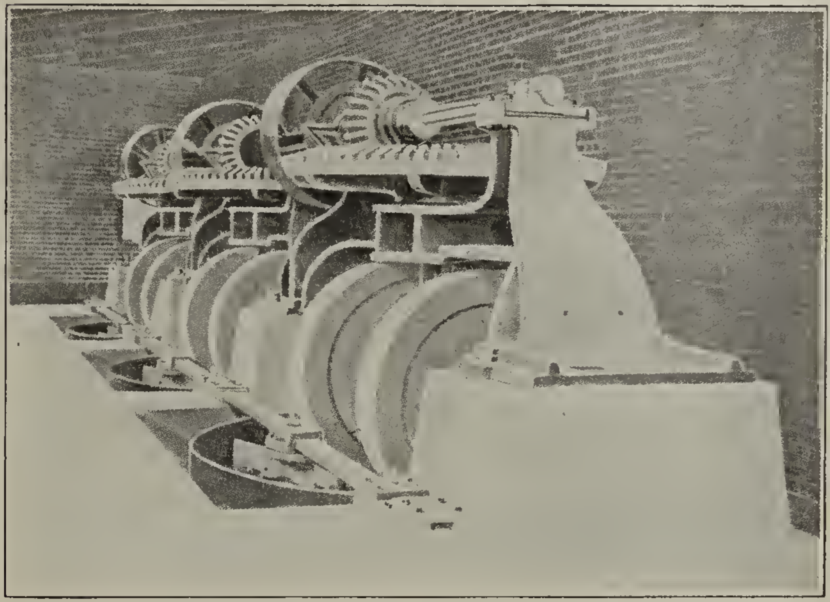
The Summitt Brick Company, Pueblo, Col., is making extensive plans for the enlargement and improvement of its plant. New machinery and kilns will be installed for the manufacture of fireproofing, drain-tile and the more popular lines of face-brick. The plant is now making fire-brick and smooth face-brick and is doing a good business. The management states that the increase in sales during 1915 was fifty per cent when compared with the preceeding year, and that the outlook for 1916 was still more promising.

CONNECTICUT

Several brick sheds and other small buildings at Wilson's station, near Hartford, Conn., suffered in a powerful wind storm on December 27. At the Wilson Brick Company's plant, a building one hundred and fifty feet long is reported to have been blown down. At Baker's brickyard, adjoining the Wilson plant, several smaller buildings were demolished. Nevols Brothers, who have a brick plant in the same neighborhood, escaped with smaller damage, the wind simply tearing off a few loose boards from the buildings.

Because of the large amount of business that is being offered Connecticut brickmakers, the early resumption of operations on the yards is being given considerable attention. This is especially true in the vicinity of Berlin, where several manufacturers have set March 1 as the opening date, and are already making efforts to secure the necessary labor. Not in recent years has such an early opening been planned. Last year the production of brick in the Berlin district was normal, in the face of the fact that large stocks were carried over

Means Nine and Ten Foot Dry Pans—A Triple Battery



¶ We can refer you to brick makers, who have been using the "Means" Dry Pan for over ten years constantly, where the "Step" and "Toe" have never had to be replaced.

¶ Let us send you drawings and detail description that will help you to understand why "Means" pans give such remarkable service.

¶ We also make 8 and 9-foot pans and a complete line of clayworking machinery and repair parts.

The Toronto Foundry & Machine Co.
Toronto, Ohio

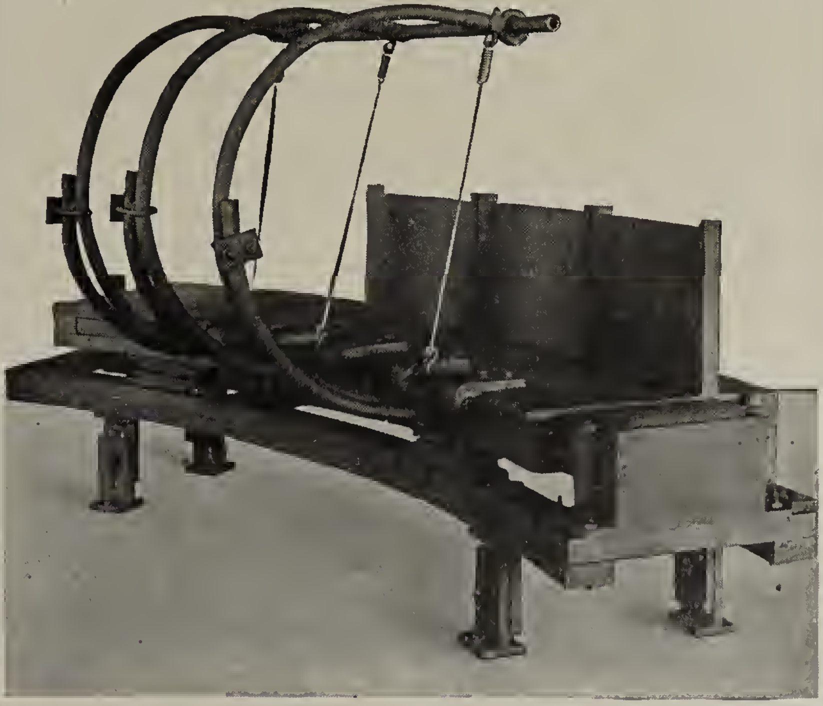
We Make Those Famous "INVINCIBLE" Brick Barrows

MANUFACTURERS OF SILO BLOCKS are interested in our NEW CUTTING TABLE—Cuts Silo Blocks Radially. The Price is $175.00.

All Iron Machine—no woodwork. One man operates it. Built like a machine tool.

Designed by engineers having had many years' successful manufacturing experience.

Built at Brazil, Indiana, the big clay center, where opportunity for advancement in clay product manufacture is constantly offered.



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Get illustrated Bulletin G 25. Do this—ORDER IN TIME

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At the Convention call on
C. B. THWING
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and let him demonstrate the workings of

THWING HIGH RESISTANCE MULTIPLE RECORD
PYROMETERS

He will have a lot of friends at the Convention who will back up his claims by telling you how they have saved money using Thwing Pyrometers.

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HETTRICK
RED STITCHED CANVAS
BELTING

You Cannot Afford to Take Chances on Your Belting

Hettrick belts are strong and are built primarily for service.

Strength of the primary fabric receives rigid inspection.

These are the reasons that our belts are giving such splendid long life service in clay plants.

Write us today for facts and prices.

Hettrick Bros. Co.
Toledo, Ohio

HETTRICK CANVAS BELTING BEATS THEM ALL

It is made from long staple cotton, giving maximum strength and elasticity.

All possible stretch is removed from the belt without weakening the fabric.

It is properly oil processed, and red dressing applied to preserve the fabric.

Finally the completed belt—is cured.

from the previous year. Early in the summer the market became flooded with brick orders for munitions plants and other war boom buildings, which sprang up rapidly thruout New England, so that now there are hardly any brick on the yards. As an illustration of how the demand is continuing, more than thirty carloads of brick passed thru Berlin freight yards during the last two weeks in January. The lack of sufficient help which caused the manufacturers considerable trouble last year, promises to be a disturbing factor when the yards open. Large increases in wages are being offered all classes of labor by many of the munition plants and busy industrial establishments not engaged in filling war orders. This has absorbed all of the surplus help, seriously affecting the labor supply.

DELAWARE

The French Clay Blending Company of Wilmington, Del., has been incorporated to blend and mix refractory clays, and to manufacture and sell refractory materials. The capital stock of the company is placed at $5,000, the incorporators being Herbert E. Latter, Norman P. Coffin of Wilmington, Del., and Clement M. Egner of Elkton.

DISTRICT OF COLUMBIA

After a contract had practically been let calling for a brick structure, government officials have just about decided that the new Department of the Interior office building, which is to cost in the neighborhood of $2,500,000, will be built of limestone. This is a keen disappointment to Washington (D. C.) brickmakers, especially since a great deal of money has been spent by them in the erection of sample panels for those who have the work in charge.

ILLINOIS

The Decatur (Ill.) Brick Manufacturing Company has added paving-brick to its line of products, an additional machine having been installed which will be run exclusively on pavers.

The Utica (Ill.) Fire Brick Company recently finished the first kiln of brick that it has made in six years. The plant has been remodeled so that it now has a capacity of 20,000 brick daily which will be increased to 30,000 in the spring.

The Broughton (Ill.) Brick and Tile Company will soon start construction work on an additional two tunnels to their four-tunnel drier. This, it is expected, will increase the capacity of the plant fully fifty per cent. The plant is now under the management of J. A. Gregg, who was, up to a short time since, in the railroad business in southern California.

The Decatur (Ill.) Brick Manufacturing Company is installing an additional unit to its grinding apparatus, which will increase its output of ground clay by more than twenty per cent. Additional kiln room will also be provided, four new kilns being in course of construction. The latter installation will put sixteen kilns on one stack, where but twelve were previously being used, and will test the principle of a single stack for the entire battery. The stack, as has already been noted in these columns, is 220 ft. high.

Rivers thruout northern Illinois, swollen by heavy rains and melting snow, did considerable damage to clay plants located on or near their banks during the third week in January. The National Fire Proofing Company's plant at Ottawa, Ill., was among those hardest hit by the flood. It was reported that every kiln at this plant was filled with water, resulting in a loss of more than one hundred tons of ware. The Chicago Retort and Fire Brick Company was forced to close its plant at this same point because of flooded pits.

"Our business in 1915 will equal that of 1914 in volume when figures are finally completed" predicts William E. Schlake, president of the Illinois Brick Company. "The year 1915 started with prospects unfavorable for the brickmaking fraternity in Chicago, then followed the strikes and differences of the workmen in the various building trades. For several weeks our plants were closed. Immediately following a settlement of the labor difference, however, a building boom was started. Many apartment and factory buildings have since been rushed to completion and others are in the course of construction."

INDIANA

The Brooklyn (Ind.) Brick Company is installing a new brick machine of more than common capacity.

The Crawfordsville (Ind.) Shale Brick Company has added a "rug" texture brick to its line of face-brick and is installing new equipment and building new kilns which will increase the capacity of the plant about fifty per cent.

The National Tile Company, Anderson, Ind., reports that 1915 was the best year in its history. The company is making a specialty of a mantel tile known as "Persian Enamel." Tile for swimming pools has also been given considerable attention during the past few years, the company reporting a quickening demand in these lines.

The Brazil (Ind.) Clay Company is doubling the capacity of its face-brick plant which includes the making of a number of substantial improvements. Owing to existing freight rates, this plant is unable at present to increase its shipping radius, but expects, thru a vigorous sales campaign, to secure a bigger business in the territory which it is now serving. Some effort has been and is being made by this company to get an adjustment in the freight rates now in force. The plant is at present running to capacity so as to have a good stock on hand when the demand opens up in the spring.

White enameled brick have been used to good advantage in solving the lighting problem of at least one of Indianapolis' subways. The passageway under the Pennsylvania Railroad Company's terminal yards in that city has had the appearance of a dungeon in years gone by, several efforts having been made at a solution of the lighting problem, without success. Finally, John Watson, a contractor, suggested the use of white enameled brick in this connection, which was used in the above mentioned subway and found to work very satisfactorily. Indianapolis has a number of tunnels where certain streets cross the railroad tracks, and it is probable that enameled brick will be used at these points, as city authorities have become thoroly converted to their use.

IOWA

Eldora (Ia.) Pipe and Tile Company is now preparing to set new boilers at its plant. A good demand in drain-tile and other hollow-ware is anticipated by this company in the spring.

The DeWitt (Ia.) Brick and Tile Company has installed a new brick and tile machine and a new steam engine at its plant. Plans are also under consideration for the erection of an additional kiln. Warren Churchhill of this company says that business is good.

The contract has been let for the installation of a complete new power plant at the Oskaloosa (Ia.) Vitrified

You can get a higher price for your brick if you guarantee it will be

Scum-Proof

And you can do this with perfect safety by using

R. H. Precipitated Carbonate of Barytes

It neutralizes the salt in your clay so that it cannot appear on the surface of the brick after it gets wet.

But don't accept a substitute—insist on R. H. —**the dependable brand.**

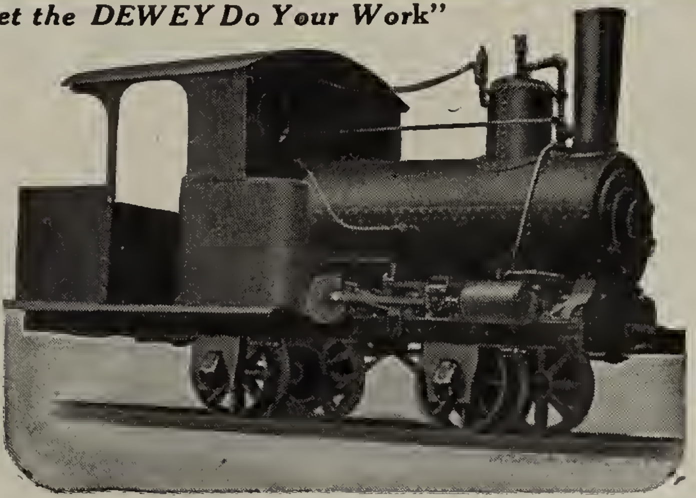
Write for circular and prices.

The Roessler & Hasslacher Chemical Company
100 William St. New York

Chicago, Ill. East Liverpool, O. St. Louis, Mo. Kansas City, Mo. New Orleans, La. Philadelphia, Pa. Boston, Mass.

We carry a complete line of high grade chemicals for the clay industry

"Let the DEWEY Do Your Work"



The Boiler of the DEWEY

The Borden Brick & Tile Co., Goldsboro, N. C., is using a DEWEY locomotive. It discarded the mule-driven car and declares it not only got an increased efficiency but reduced the cost of hauling.

This concern hauls eighteen cubic yards of clay to a load on a trip of one and a half miles.

How many mules would it take to do this same thing and how long would it take them to do it?

It is our own special design. It has unusually large capacity, is a quick steamer, and is economical in fuel consumption.

These three characteristics have made the DEWEY especially adapted to clay pit work.

Strong, Safe, Long-Lived

The DEWEY boiler is designed to reduce to a minimum the numerous angles and corners and pockets which serve as collecting places for mud and scale—distressing features about every standard locomotive boiler.

The DEWEY boiler, therefore, is stronger, safer and longer-lived and does BETTER work than the regular types.

The DEWEY sells for several hundred dollars less than any of the standard type locomotives of the same size and weight............... **$1350**

DEWEY BROS.
Goldsboro, N.C.

THE KILN THAT PAYS

The Improved Hook Patent Up and Down Draft Kiln

It eliminates the waste of imperfect ware, and burns with a uniform hardness both top and bottom. It increases output by shortening the time by one-quarter to one-half usually required for burning each kiln, and lowers costs by saving in time and fuel.

The above is a Photograph of a 26-ft. IMPROVED HOOK PATENT UP AND DOWN DRAFT KILN at the Forest Brick & Tile Works, Forest, O., that is burned regularly from 45 to 50 hours, and only consuming from 9 to 10 ton of coal to each burn.

We are doing it for others; we can do it for you. THE IMPROVED HOOK PATENT UP and DOWN DRAFT KILN will solve your production problems. Sold only by the OHIO KILN CO.

LET US PROVE OUR CLAIMS.

Mr. C. Hook is associated with our Company, and no plans leave the office without his stamp of approval.

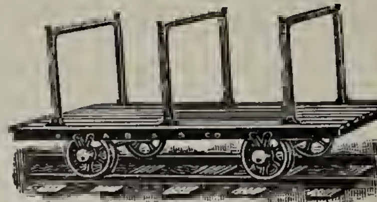
For further information address

Ohio Kiln Company, Vigo, Ohio

REDUCE YOUR HANDLING COSTS

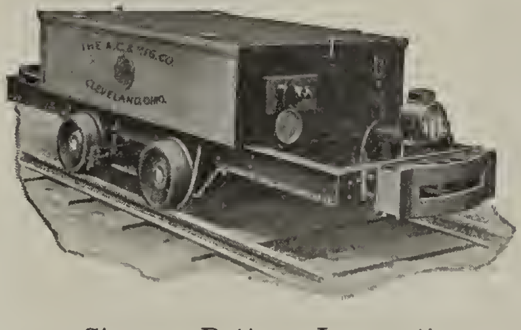
By the Purchase of Efficient Equipment

No. 217-E. Side Dump Car Equipped with Motor



ATLAS High Efficiency Cars and Electric Locomotives

No. 126 Double Deck Dryer Car



will meet your requirements. Let us send you catalogue and quote prices.

Storage Battery Locomotive for general use.

THE ATLAS CAR & MFG. CO.

1287 Marquette Road, Cleveland, Ohio

Brick Company's plant. This includes two new one hundred and fifty horsepower boilers, a new two hundred and fifty horsepower engine, new pumps and auxiliary equipment.

The Buckeye Clay Products Company, of Belle Plaine, Iowa, a concern that was organized during the past year, held its first annual meeting recently, electing the following officers: Dr. J. A. Williams, president; W. J. Guinn, vice-president, and G. R. Ahrens, secretary and treasurer. J. L. Greenwood will continue as superintendent of the plant.

A demand greater than the output is reported by the Rockford (Ia.) Brick and Tile Company. During the latter part of 1915 this company erected a one hundred and twenty-five foot brick smoke stack at its plant, giving draft for six kilns and two boilers. No further improvements are contemplated until summer, when four kilns may be added to the present battery.

The What Cheer (Ia.) Clay Products Company is building a new thirty-six foot round down-draft kiln at its plant to take care of an increase in business that is looked for during 1916. This company had an interesting exhibit of its products at the Northwestern Lumbermen's Association Convention held at Minneapolis, Minn., January 18 to 21. At this meeting a great many of the local dealers were present. These men, in addition to handling lumber, are agents for clay products, particularly drain-tile, and so the exhibit was a well-considered plan for the advancement of this company's interests with the lumber dealers of the Northwest.

The Harvey (Iowa) Brick & Tile Company reports that it has just closed the best year it ever had and the outlook for 1916 "could not be better." The plant was shut down Dec. 15th and is now being generally overhauled. This company believes in developing its home market and is conducting an intensified selling campaign among the farmers in the locality of Harvey, suggesting hollow tile for all kinds of farm buildings, including residences, silos, barns and smaller buildings. T. G. Neiswanger, secretary, writes: "I think it would be wise for all clay manufacturers to stay as near home as possible. We were surprised to find the good business that we were passing up trying to reach out after business that properly belonged to our competitors. There is nothing to it. Let your competitor live. He is as fond of porterhouse steak as we are."

KENTUCKY

An extensive advertising campaign in local newspapers and other mediums, followed up by strong circular matter, is the plan of the Madisonville (Ky.) Drain Tile Company, according to its secretary and manager, J. D. Bobbitt. Hollow-tile for city residences and for farm buildings will be the subject for most of the "copy" that will be run. The company reports a good demand now existing for its products.

LOUISIANA

A new granulator has been installed at the plant of Delatte and Lagrange, Lake Charles, La. This company reports good prices prevailing for brick and other clay products in its territory.

MASSACHUSETTS

A. B. Hews & Company, Inc., of Cambridge, Mass., report that the flower pot business is improving and that they look for a very good season. This company makes a very fine product and believes in not only maintaining quality but selling on a quality basis.

It has long been predicted that the high wages paid machinists and others connected with the manufacture of munitions would result in either higher pay or shorter hours on some of the New England brick plants. E. L. Cook of State Farm, Mass., reports that the first of the year his plant went from a ten-hour to a nine-hour day, the wage scale being maintained.

MICHIGAN

The Grand Ledge (Mich.) Clay Products Company has added large drain-tile to its list of products, the new sizes ranging from fourteen to twenty-four inches.

The Baker Clay Company of Grand Ledge, Mich., held its annual meeting on January 13, the following officers being re-elected: D. D. Shane, president; J. W. Ewing, vice-president and J. D. Summers, secretary and treasurer.

Extensive repairs are now under way at the plant of the Detroit Vitrified Brick Company's plant near Corunna, Mich. The company is well supplied with orders, it is stated, and operations will be resumed soon after February 1 with a full force of men.

The Egle Brothers Manufacturing Company, of Detroit, Mich., has made a number of improvements to its plant, which will increase the capacity and enable this concern to take care of the large amount of business which has come its way in common with practically all Detroit brick yards. Arthur G. Egle reports that further improvements are contemplated, but that the nature of these has not as yet been decided.

"We have no stock in our sheds now, nor will we have for spring, if this open weather continues," said a prominent Detroit brick manufacturer recently. "Building operations during January, and for the two previous months, have far exceeded those of the same period last year. The result is that brickmakers are making every effort to keep the production up to the point where it fits the demand, the brick being used in buildings as fast as it comes from the kilns." Figuring on the present capacity of the Detroit plants, at least a month would be required to accumulate a stock sufficient to meet the spring demand, which is already beginning to make itself felt. But on account of the open winter activity in building continues, demanding a large supply of brick. If brick manufacturers do not get an opportunity to stock ahead for spring it is the local opinion that Detroit will see the greatest scarcity of brick in its history.

MINNESOTA

The Minneapolis (Minn.) Clay Brick Company has moved its offices to 312 Plymouth building in that city where it expects to serve its customers on a larger scale and with a greatly increased capacity of common-brick.

MISSOURI

A. J. Herman, of the Herman Brick Company, St. Joseph, Mo., says that it looks like his company will do a good business in 1916. Minor repairs are being made about the plant in preparation for a busy season.

A. A. Vancleave, proprietor of the Grand View Fire Clay Mines of St. Louis, Mo., reports that business is the best that it has been in the last twelve years. This company has opened and developed the largest fire-clay mine that has ever been operated in the corporation limits of the city of St. Louis.

At a recent meeting of the Moberly Paving Brick Com-

THE THEW SHOVELS

Would You Like to Know Just What It Costs Others to Dig Clay and Shale?

THEN JUST ASK

for Circular 22 A. In it is compiled a record of actual results gathered from 55 different clay plants, many with conditions identical to your own. Cost per ton, per yard, and per thousand of brick are given, several photos of clay pits are shown, and other information incorporated of a character that will interest all clayworkers.

Thew Shovel which saves wages of 10 men every day

There are now

Over 300 Thew Shovels in the Clayworking Industry

a fact which conclusively proves their great adaptability for the conditions peculiar to this work.

The Horizontal Crowding Motion and other Thew features of particular advantage in this work are also fully described in this circular.

This is just another booklet such as business men are anxious to read in order to keep abreast of the times with reference to their industry.

Send for your copy today.

SIGN AND MAIL OR USE FOR MEMORANDUM

The Thew
Automatic
Shovel Co.
Lorain, Ohio

Send me circular 22 A, giving cost facts for digging clay nd shale and other nformation of interest as advertised in "Brick and Clay Record."

Name.............................
Address...........................

THE THEW AUTOMATIC SHOVEL CO. LORAIN OHIO

pany of Moberly, Mo., O. W. Renkert of the Metropolitan Paving Brick Company, of Canton, Ohio, was elected president of the Moberly Paving Brick Company, J. G. Barbour, vice-president, and Warren L. Barr, treasurer and general manager. The election was held at Canton, Ohio.

The W. S. Dickey Clay Company, Kansas City, Mo., reports a large volume of business in fire-brick. Owing to the fact that this company has kept its plant in first-class operating condition, probably in anticipation of an increased refractory demand, it is now able to handle, to the best advantage, the large amount of business that is developing in this line.

Carl W. Stookey, president and general manager of the Edwards Brick Company, Columbia, Mo., reports that the outlook for a large business during 1916 is the best in the history of the company. During the past few months a new hollow-ware machine has been installed at the plant for the manufacture of drain-tile, hollow-tile and silo blocks. A drag belt is soon to be installed in the clay storage shed. Arrangements are also being made to open a coal mine and new fire clay pits. In the spring it is the expectation of Mr. Stookey to put a salesman on the road to develop a hollow building-tile and drain-tile business among the farmers.

MONTANA

The Great Falls (Mont.) Sewer Pipe & Fire Proofing Company is installing a new four-mold press and two thirty-foot round down draft kilns. This plan is now making dry press face and fire brick.

NEW JERSEY

The National Park (N. J.) Company has been incorporated with a capital of $100,000 to manufacture brick. The incorporators are Daniel B. Curll, H. V. Curll and A. M. Cooper of Philadelphia, Pa.

NEW MEXICO

The New Mexico Fire Brick Company of Gallup, N. M., held its annual meeting recently, electing the following officers: T. B. Catron, president; Gregory Page, vice-president and T. E. Purdy, secretary. It is reported that, for the first time in its history, this plant has shown a small balance on the right side of the ledger, and under the present management it is expected that 1916 will be a banner year in the business of the company. The plant is now supplying the Santa Fe Railroad with all of the material that goes into the construction of furnace linings for oil burning locomotives operating thru that territory.

The Central Clay Products Company of North Tonawanda, N. Y., has increased the capacity of its plants by re-arranging the crusher room equipment. Additional kilns will be built just as soon as weather conditions permit. The company, according to H. Jason Knapp, expects to get out some new literature on its products very soon.

A new face-brick, which will be known as the "Claycraft Raglan," will be placed on the market early in March by the Claycraft Brick Company, of Columbus, Ohio. This company is now manufacturing eight different kinds and textures of face-brick. Business is about the same now as it was last year at this time, according to sales-manager E. C. Howard, but prospects are much brighter, especially in the eastern central states.

NORTH CAROLINA.

Johnson and Johnson Company of Raleigh, N. C., reports a fair demand for its products with prospects for 1916 very

Are You Going to Change
Your Burning System—
Are You Satisfied
With Results of This Year
?

There is one system that is proving satisfactory, year after year of use, in many plants—

The Hook Patent System of Kiln Burning

combines many features of merit impossible in the ordinary kiln design. It approaches nearest to perfection of any periodical kiln. It is inexpensive to install—but the returns to you are big. It consumes less coal—it watersmokes top and bottom equally well—it burns uniformly—and it does it all in considerable less time.

Hook Patent Kiln Co.
Vigo, Ohio

Canadian Office
250 Dufferin Street Toronto, Ont.

good. This company built an addition to its plant during the past year at a cost of $100,000, at which re-pressed face-brick, as well as commons, are being made. The capacity of the two plants is now thirty million brick annually. The company has added a traveling salesman to its force and is doing some advertising.

The recently formed Shale Paving Brick and Fireproofing Company has taken over the plant of the Dan River Brick Company at Pine Hall, N. C., and announces that the plant will be immediately overhauled and enlarged for the manufacture of paving-brick and hollow-tile, as well as a first class face-brick. The officers of the new company are C. M. Thomas, president; James L. Wall, vice-president and general manager; and Joel R. Hill, secretary and treasurer. The capital stock of the company is placed at $100,000.

OHIO

The Claycraft Mining and Brick Company, of Columbus, Ohio, has increased its capital stock from $150,000 to $200,000.

Baab Brothers, manufacturers of brick, hollow-tile and drain-tile, at Canal Dover, Ohio, have enjoyed a very prosperous year during 1915, with prospects for 1916 indicating a still better business.

The Domestic Clay Specialty Company of Canton, Ohio, has been incorporated with a capital stock of $25,000 by William C. Marlot, D. W. Alexander, Charles Marlot, F. M. Smith and W. T. McCormish.

The McArthur (Ohio) Brick Company at its annual meeting, held recently, elected the following board of directors: H. S. Hamilton, L. W. Sprague, O. F. Pilcher, W. C. Fischer, A. Will, Jr., O. E. Vollenweider and I. M. Lantz.

The Moores-Coney Company, Cincinnati, Ohio, reports a sufficiently large number of orders on hand to make prospects for 1916 look very bright indeed. The company, like most other concerns, is not making many deliveries at the present time.

The Richardson-Lovejoy Engineering Company has decided to discontinue. Hereafter, the business done under that corporate name, will be done in the name of Ellis Lovejoy, E. M., consulting engineer. Offices will be maintained in Columbus, Ohio.

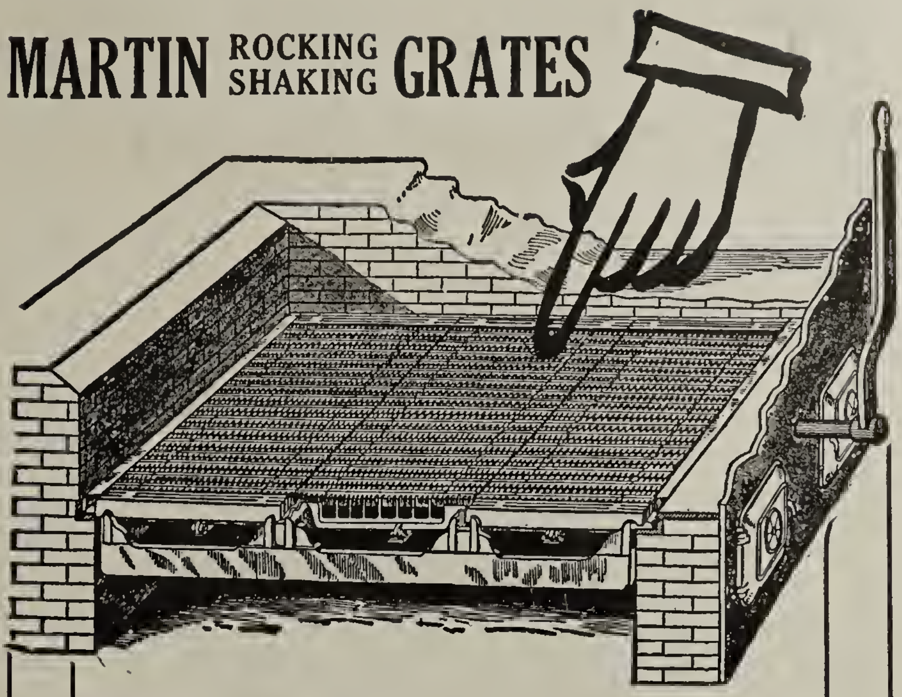
W. D. Richardson, formerly of the Richardson-Lovejoy Engineering Company, and later in charge of the Shawnee (Ohio) plant of the Claycraft Mining and Brick Company, will sever his connection with the company last named, on or about March 1, leaving him free to carry out plans which have been in preparation for some time. Due announcement of these plans will be made in a near subsequent issue.

The Brick Sales Company, Cincinnati, Ohio, recently moved its offices in the St. Paul building to an adjoining suite in the same building, which will provide somewhat larger quarters. With more room available, the company is arranging a more extensive display of its lines.

Owing to river improvement work at Tiffin, Ohio, which has caused the removal of many brick buildings, the demand for common-brick during the past year has been exceptionally poor but even with this handicap, the local yards have sold out practically all of their stock and the outlook for a good season in 1916 is very bright.

Business is good for this season of the year, according to A. W. Hart, general manager of the Diamond (Ohio)

MARTIN ROCKING SHAKING GRATES



The Ironclay Brick Co.
says—

We have your favor of the 20th in reference to the Martin Shaker Grate.

We beg to advise that we have been using the Martin Grate for a number of years and it has proven entirely satisfactory in every way and we are glad to recommend it.

Very truly yours,

The Ironclay Brick Co.
(Signed) J. M. Adams,
Sec'y and Gen. Mgr.

We couldn't say more. The letter is sufficient recommendation. Send for our catalog and proof that this grate saves a big portion of your coal bill.

The Martin Grate Co.
347 S. Dearborn Street
CHICAGO ILLINOIS

Brick and Tile Company. A new company house for its employees has just been completed. The company has purchased a combined hollow-ware machine for building blocks and drain-tile.

New fireproof buildings, a new steam engine and a drier with a daily capacity of 30,000 brick, are recent improvements at the plant of the Ithaca Brick and Tile Company, Inc., of which I. K. Bernstein is president and general manager. This company reports business as being good. A greater shipping radius for the products of this company is being sought. This, together with the development of a larger demand in the present market, is expected to boost 1916 sales.

The Pursell-Grand Company, Cincinnati, Ohio, recently secured the order for the salt-glazed brick to be used in the basement and corridors of the new courthouse. About 300,000 of these will be required, and will be made by the Stark Brick Company, of Canton, Ohio. A large order for the same type of brick, to be used in the new Lafayette-Bloom school was also secured by this company.

The Tiffin (Ohio) Brick Company, which succeeded J. A. Hall & Company of the same place, has made extensive improvements, including the erection of a new machine building 40 by 70 ft., the installation of a new disintegrator and 1,400 ft. of steel track, as well as a cable system of haulage. Arrangements have also been made to use electric power. W. L. Lehne, who was formerly associated with Karl J. Heilman in the Tiffin Brick Company has sold his undivided half interest to the latter, who will continue to operate the plant under the name of the Tiffin Brick Company.

A warm controversy arose recently among farmers and other residents on the Allentown road, near Lima, Ohio, which is to be paved within a few months, concerning the material to be used. It was first decided to use concrete, but a large number of the taxpayers, especially the farmers, declared themselves emphatically in favor of brick. A petition demanding that the specifications be changed to brick, was circulated with good effect, resulting in favor of that material. While estimates show that brick will cost $7,400 more than concrete for the four miles of road to be paved, those in favor of the first named material believe that it is worth the difference.

The demand for clay products in Cleveland, Ohio, at the present time is unusually good, considering the season of the year. A large number of building operations were started late in the fall, and, because of the open weather, it has been possible to continue work on them. The Chandler Motor Car Company, which is situated in a comparatively new section of the city, has just let the contract for a new addition to its already large group of buildings. This new building will be built of brick. In the same location, it is reported, a contract has been let for a factory building by an automobile accessory concern which is moving to Cleveland from Detroit. This will also be of brick.

OKLAHOMA

W. G. Skelly of Tulsa, Okla., has purchased the Cooper interest in the firm of Cooper and Bones, of Ada, Okla., and the Cooper and Bones plant is now being operated under the name of Bones and Skelly. A number of improvements have been made to the plant, including the installation of a steam shovel and the equipment for burning natural gas.

The Ponca City (Okla.) Buff Brick Company has been

The Very Clay Car You Have Been Looking For

The "Youngstown" Clay-Plant Special

Although our dump-cars have been used for several years in some of the best equipped and largest clay plants in the country, not until now, have we attempted to tell clay products manufacturers, generally, of the merits of our cars.

We have waited—and have watched carefully the actual daily performance of these cars—and now we say to you that we can offer you cars that we can safely guarantee to give you longer service, at a lower cost of upkeep, and with greater ease of operation than any other cars you have ever used.

We don't ask you to take our word for it though—write The American Building Brick Co., at Cleveland, and ask them. We'll give you the names of others too, if you'll ask us.

A request will bring our catalog.

The Youngstown Steel Car Company
YOUNGSTOWN, OHIO
"In the Heart of the Steel Industry"

incorporated by C. W. Field of Ponca City; Dave Oliver and J. G. Ramsey of Pickwell, Okla.; W. H. Powell of Atlanta, Ga., and W. J. Smith of Wellington, Kan. The capital stock of the company is $75,000. For several years it has been known that there are shale beds of considerable magnitude in the vicinity of Ponca City and at various times there has been talk of their development, but nothing has ever been done to take advantage of the opportunities offered until the organization of the above company which will develop these deposits.

ONTARIO

The Hepworth (Ont.) Silica Pressed Brick Company will build a brick plant shortly to cost in the neighborhood of $15,000. C. S. Block is manager.

OREGON

The week of Jan. 17-22 was designated "Letter Writing Week" in Oregon, its purpose being to interest people in all other parts of the country in the charms of Oregon and the welcome that will await visitors. It is said by those that claim to have some idea of what has been done, that more than 100,000 letters extolling the scenery, beaches, the roadways and climate of Oregon have been sent from Portland to Portland and while the net results will not be known for many months, some very complimentary things are being said about the man who started the idea of having a letter writing week.

PENNSYLVANIA

The Kennedy Refractories Company is a new corporation, having recently been granted a charter at Lancaster, Pa. H. A. Kennedy, R. J. Landis and I. B. Engle are interested parties.

The Paxton Brick Company of Paxtonville, Pa., is rapidly growing in size and importance. Altho the plant was recently enlarged, it is still unable to take care of all of the business that is being offered.

At the annual meeting of the Freeport (Pa.) Clay Products Company the following officers were elected for the ensuing year: T. O. Jones, president, and J. A. Graheimer, vice-president.

The Dubois (Pa.) Clay Manufacturing Company is a newly formed company, having been incorporated with a capital stock of $16,000 by S. J. Schrecongust, A. S. Moulthrop and H. E. Boner of Dubois.

During 1915 the Hamburg (Pa.) Brick Works manufactured 2,400,000 brick, which kept forty-five men employed full time during the entire year. The outlook for 1916 is very promising, building operations in the towns in the northern part of Berks county, as well as in Reading, Pa., to which this plant ships, being unusually active.

The stockholders of the Waynesboro (Pa.) Brick and Supply Company at their annual meeting re-elected its board of directors consisting of B. R. Summer, A. T. Hess, Hon. J. Edward Beck, A. R. Warner, S. D. Hockman and William Johnson. The company declared a dividend of five per cent on its stock out of the earnings for 1915.

The Face and Fire Brick Company of Eastvale, Pa., formerly the Douglass-Whisler Brick Company, again changed ownership when the Fallston Fire Clay Company bought the plant and property recently. William Drayton, formerly superintendent for the Hocking Valley Products Company at Greendale, Ohio, has been engaged as general superintendent for all of the Fallston plants.

Have You Tried Gandy Belting?

You have been reading about it for 37 years—provided you have been using belting for that length of time. And during all these years sales of

Gandy

Stitched Cotton Duck Belting

have increased constantly, so that you can feel positive that GANDY is a good sounding belting proposition, giving thousands of concerns satisfactory service for less money than they can get with any other.

Have you tried it yet? If not, investigate its possibilities now. It is water, oil and dust proof; made by a patented method that prevents stretching, and has a tenacious hold on the pulleys that prevents loss of power through slippage.

Write us today for a sample and prices. Address

The Gandy Belting Company
732 West Pratt Street
Baltimore, Md.
New York Branch — 36 Warren Street

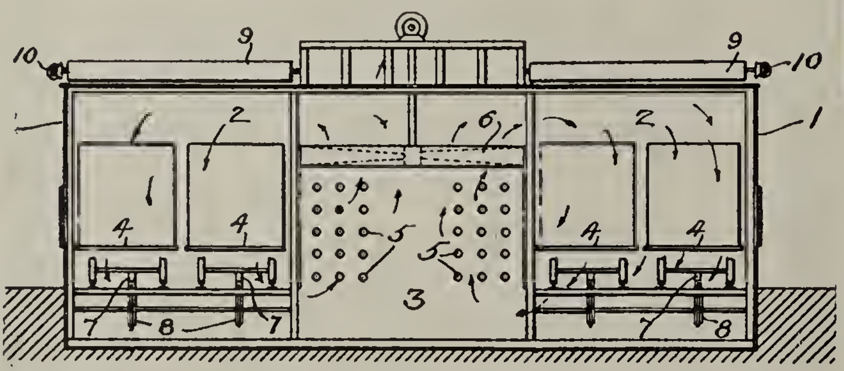
GANDY

"PROCTOR"
The Big Little Dryer

Is simply practical adaptation of well known principles regarding the application of heat to clay and the constant circulation of the heated air.

It is not an experiment—but it has proven its efficiency in every day practice in some of America's finest clay plants.

Study this plan for a few minutes and you'll grasp the idea:



This is a transverse sectional or end view. The steam coils (5) are shown just beneath the fans (6) and the trucks (4) carrying the green ware are on either side, (7) having projections which engage an axle on each truck. These chains pass over wheels (8) which, turned, either by hand or power, the trucks may be moved a predetermined distance.

In another type of the "Proctor" the steam coils (5) are on either side of the trucks (4). This is a better arrangement under certain conditions.

By a simple arrangement of fans the heat waves, which move, naturally, *upwards,* are kept in *active* circulation and, literally, like a hot and powerful torrent, are forced to penetrate every nook and crevice in the drying chamber.

By another simple mechanical device the conveying cars pass through this torrent of uniform heat, at a *regulated* pace.

There's More To Tell About
The "Proctor" Way—Ask Us

Philadelphia Textile Machinery Co.
Philadelphia, U. S. A. Hancock and Somerset Streets

MACHINERY and EQUIPMENT

Being Descriptions of Such Machinery and Accessories as Our Advertisers Have to Offer and Such Announcements as Are of Interest to Our Readers

Drilling and Blasting

The clay plant that is making a study of operating costs would do well to start at the very beginning of the process of manufacture, and analyze the cost of securing its raw material. For instance, those concerns that use hard shale, and must blast it out, are their methods the most economical—are they securing the greatest amount of material for the smallest expenditure?

To get the proper perspective it is necessary to consider the "drilling" and "blasting" as occupying a certain position in what might be termed a cycle of operations, due to the fact that these two are practically the first operations in quarrying material, and the effects of these operations are not confined to the operations themselves, but continue on down through the entire production program.

Some manufacturers seem to have the idea that drilling and blasting is a unit operation, which stands alone, and has no influence on the rest of their production, but, as stated above, this is not true. The better, and at the same time the more economical your method of drilling and blasting, the lower will be your final production costs.

It has been proven in hundreds of installations (including a considerable number in clayworking plants) that the "Big-Hole Method of Drilling and Blasting" will show a very perceptible saving in the item of drilling, also in the item of explosives. These savings are brought about by the fact that with the "Big-Holes" it is possible to move more material per unit of expenditure in drilling, and also possible to move more material per unit of investment in explosives.

There are other advantages to be found in adopting this "Big-Hole" method which such companies as Purington Paving Brick Company, Alton Brick Company, Hydraulic-Press Brick Company and others have found out in actual experience. The Sanderson-Cyclone Drill Company, manufacturers of the Cyclone Drill, Orrville, Ohio, will be glad to tell you more about it and furnish bulletins illustrating and describing the Cyclone.

The Youngstown Car

Altho the Youngstown Steel Car Company, of Youngstown, Ohio, has been manufacturing cars for some years, it has waited until the present time to offer them to the trade generally, feeling it the wiser plan to have them first thoroly tried out before installing them in a large number of plants.

The fact that they have given such splendid satisfaction has caused the Youngstown company to start a campaign in the clay products industry, which will, it is hoped, lead to a very extended use of the Youngstown car in brickmaking and other clayworking plants.

The Youngstown company has unusual facilities for taking care of any business that may come to it as a result of this campaign, the plant location being ideal—placed as it is in the very heart of the iron and steel belt—and at the intersection of five large railways, spurs from whose tracks enter the Youngstown company's yard.

The experience that the Youngstown company has gained thru years spent in the studying of the problems of economic handling of materials, makes it competent to meet every demand and condition. During this time, the company has been called upon to design and build thousands of cars for special purposes, and these have covered so diversified a range of usage that there is practically no branch of industrial car service that has not come under the supervision of the Youngstown company's engineers and draughtsmen.

The Youngstown plant is equipped with the most modern machinery and has its own foundry where are turned out the famous "Youngstown" chilled wheels. There is also a separate steel car department and a wooden car department.

A Note on Clocks

It came from the Sioux City Brick & Tile Company, Sioux City, Iowa.

It says: "Yours of November 10th at hand regarding watchman's clock system manufactured by Hardinge Bros.

"We are certainly pleased to recommend this clock system to any one. We are using it on all seven of our yards with great success and can most heartily endorse same."

Hardinge Bros., 1760 Berteau Avenue, Chicago, Ill., will be glad to furnish full information to interested clay-product manufacturers.

Look up their exhibit at the convention, Room 325 Hotel Statler.

At the Convention

The Brown Instrument Company, Philadelphia, Pa., will be represented by Sales Manager Jno. P. Goheen, Chicago Representative J. W. Lazear, and Pittsburgh Representative G. L. Clapper, with headquarters at Room 339, Statler Hotel. These gentlemen will have with them a full line of indicating and recording pyrometers, draft gages, and other appliances for use in burning brick, and for driers, and will introduce a new recording pyrometer which will make a record of eight kilns at one time on a single instrument.

A Nine Acre Clay Machinery Plant

The accompanying illustration shows the new plant of Crawford & McCrimmon Company, Brazil, Ind. They have a 9-acre site, and 100,000 sq. ft. of floor space. The company has been in business since 1869, and have only recently built this modern plant, which is conceded to be one of the best factory lay-outs in the United States in this line of work. Modern tools and appliances are used to good advantage, and one central power plant generates electricity for the grouped motor-driven machines, cranes, etc.

They are located in the center of a large and important

THE STEVENSON COMPANY

THE STEVENSON COMPANY

THE STEVENSON COMPANY

WE WANT
To Meet Every Clayworker at
the Convention in
Our Room—No. 443
Hotel Statler

WE WANT
You to have one
of our
Catalogues—Just Out
and
Souvenirs—Our Latest

YOU WANT—
—WITHOUT FAIL
To read in the CONVENTION
NUMBER what some of the
world's greatest Clay Product
Companies think of the Stevenson machinery.

THE STEVENSON COMPANY

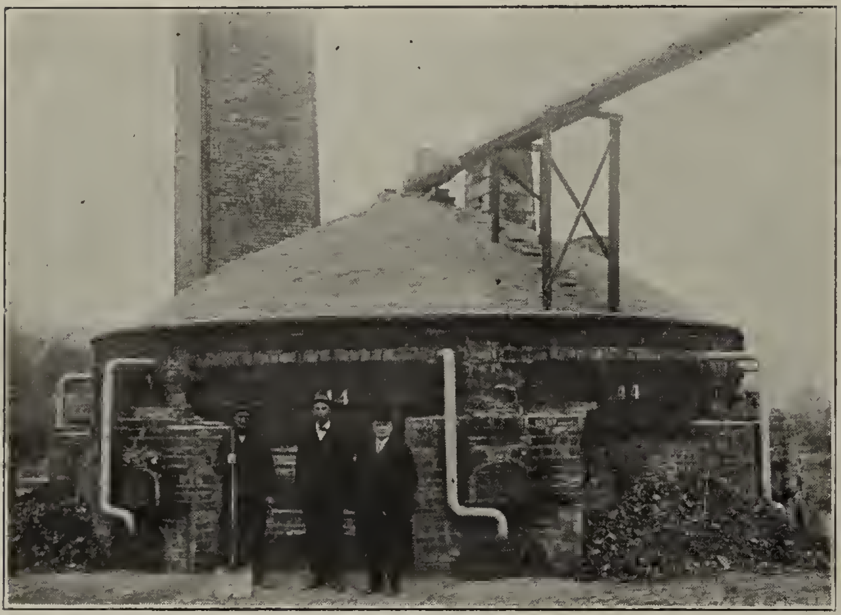
THE STEVENSON COMPANY

THE STEVENSON COMPANY

THE STEVENSON COMPANY

SAY I SAW IT IN BRICK AND CLAY RECORD

In $5\frac{1}{2}$ Days



The McManigal Superheating System—watersmokes, and burns a thirty foot kiln of Hocking Valley Paving Block, in five and one-half days.

This is accomplished not by an expensive, intricate installation, but by collecting and utilizing the radiated heat from the crown.

McManigal's patented method of building two crowns with a space between permits of the salvage and use of heat that formerly was waste.

It can be applied to any kiln of the down draft principle — It has actually shown a saving of over 30% in time and fuel.

You should equip at least one of your kilns this winter—before the busy season.

Will gladly send additional information and testimonials.

The McManigal
Grateless Furnace Co.
LOGAN, OHIO

clay-products manufacturing district, and handle an extensive business with the clay trade.

Waste heat fans, friction hoists, silo cutting tables, roofing tile presses and mine machinery equipment are built by them. The plant is operated day and night, employing 225 skilled workmen, and this force is being increased as rapidly as possible.

Dunn Family Steadily Growing

The Dunn Wire-Cut Lug Brick Company of Conneaut, Ohio, has had three prominent additions to its family of licensees: the Burton-Townsend Company, of Zanesville, Ohio, with two plants and a present daily capacity of 160,000 pavers, and the Trimble Paving Brick Company of Dayton, O., with one plant at Trimble, Ohio, and another at Glouster, Ohio. These two companies are among the largest and most prosperous in Ohio. The Thornton Fire Brick Company, Clarksburg, W. Va., with plant at Thornton, W. Va., another well known concern, makes the third concern.

In addition, the Deckman-Duty Brick Company of Cleveland, Ohio, another Dunn licensee, has consolidated with the Wooster Shale Brick Company of Wooster, Ohio, under the name of the Medal Paving Brick Company. This adds one more plant to the three which the Deckman-Duty company owned—one at Cleveland, O., one at Carrollton, O., one at Malvern, O.

These accessions give the Dunn company 29 licensees, operating 46 plants.

Outlasts the Belt

The clayworking industry feels the need of a reliable, heavy-duty belt fastener designed to meet the severe conditions existing in the plants.

The Crescent Belt Fastener combines strength, simplicity and safety with ease of application and shortening.

This device removes no material from the belt, thus preserving its full strength. Once made, a Crescent Joint needs no further attention and will outlast the life of the belt itself. These fasteners are adapted to all belting of every length, width, and thickness. Crescent Belt Fasteners make a belt smooth-running, silent, and practically endless.

Full information can be obtained from the Crescent Belt Fastener Company, 381 Fourth Avenue, New York City.

The Improved Hook Patent Up and Down Draft Kiln System is sold only by the Ohio Kiln Company, Vigo, Ohio, and manufacturers interested should get in touch with them. Unsolicited testimonials that have come to them from clay plant owners who are using these kilns, testify to the perfect control of heat, the uniform production of ware, and the saving in time and fuel obtained with the "Improved Hook" kiln.

The Schurs Oil Burner

The Schurs Oil burner has met with continuous success in all classes of industries where oil is burned as fuel.

In the clay industry, a great many plants have found it economical to use oil and have equipped with Schurs burners. The W. S. Dickey Clay Mnfg. Company, of Kansas City, Mo., uses these burners on six different plants, having a total installation of over 800 burners.

A letter from the Lehigh Sewer Pipe & Tile Company, Lehigh, Iowa, says that they have been using 126 of these burners for two years in their sewer pipe plant at Lehigh, and were much pleased with them—having given not a minute's trouble.

They go on to say that what they particularly like about the burner is the simplicity of same and the matter of the adjustment on low fires. With other styles of burners they had been bothered in watersmoking, but this difficulty was entirely obviated with the Schurs.

The Schurs Oil Burner Company is located at 1007 N. Main St., Los Angeles, Calf., and will send more complete information on request.

More About Cling-Surface

In a recent issue we called attention to the calendar which the Cling-Surface Company, Buffalo, has been sending out to the trade. This calendar illustrated the position of a belt before and after using Cling-Surface.

We are now in receipt of copy of a letter written to the New York office of the Cling-Surface Company by the man who had the care of the belt shown, and feeling that it will be of interest to all belt users, we reproduce it, in part, below:

"We have just received a fine calendar from the company at Buffalo showing my belt.

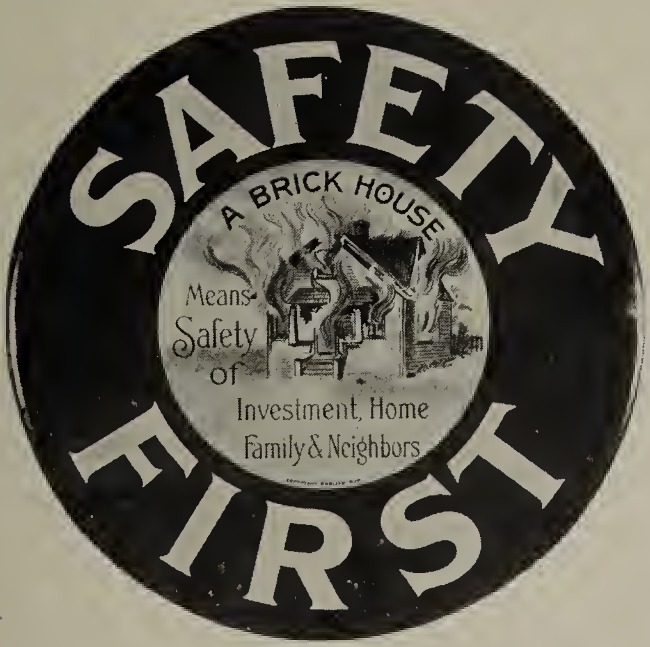
"I wish the picture showed the belt as it is today. It was only 18 inches slack when the photograph was made (it is 16 ft. centers), but now when many of the machines happen to shut down near together, causing the pressure to rise to 110 lbs. the top side will sag down almost to the bottom—like a horse working hard to keep the load moving, seems to realize that it has got to get down and pull. It never slips nor shirks.

"It is amazing how little Cling-Surface is required after you are well started. This belt gets about one tablespoonful monthly, and our other belts in proportion. They are all in better condition today than they were 4 years ago.

"Safety First"

"Safety First" is the warning message of a sign sent out with the compliments of the American Clay Machinery Company, Bucyrus, Ohio.

The accompanying illustration is a reproduction of this sign, which is meant for indoor use.

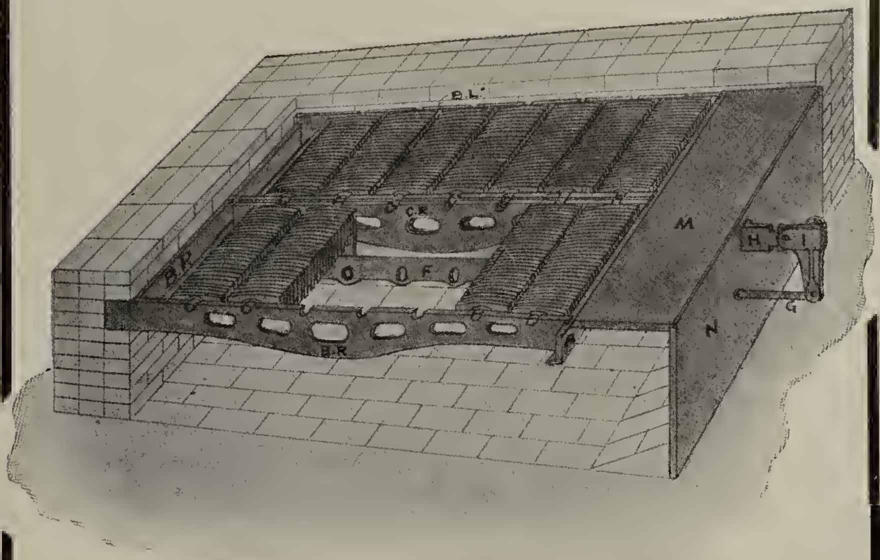


Duplicates of this excellent ad can be secured from the Clay Products Advertising Company, Box 180, Chicago, Ill., at a cost of $18.00 per hundred, or in smaller quantities at twenty cents each.

Don't Read This Ad.
if—
You Don't Use Boilers

otherwise—read it—there is good news about

Cyclone Boiler Grates



Here are our claims—

Even distribution of draft.
No fuel gets into ash pit.
Locks level.
Burns cheap fuel.
No fingers to burn off.
Impossible to warp.

That's the kind of grate that you want

and we will sell it to you on 90 days trial.

Write now for our Complete Catalog.

Cyclone Grate Bar Co.
BUFFALO, N. Y.

SPECIAL FEATURE ARTICLES

THE BLACK DIAMOND

What we do to help dealers in advertising and selling VULCAN COKE

Atwill-Makemson Coal & Coke Company

Practically all Coal Miner's Wage Agreements Expire April 1.

Your future supply of coal depends on the outcome of negotiations, which will begin at Mobile, Ala., February first.

For first-hand information concerning this Wage Controversy and its bearing upon your business, become a regular reader of THE BLACK DIAMOND as so many clay product manufacturers already are. Each week's issue contains a vast amount of news of vital interest and importance to you.

Costs but $3.00 a year, 52 issues

THE BLACK DIAMOND

"The coal trade's leading journal"

CHICAGO

New York Cincinnati Pittsburgh

THE BUYERS' DIRECTORY

Of Clay Products Machinery Manufacturers

Analysts and Chemists, Clay.
Ceramic Sup. & Cons. Co.

Aerial Tramways.
Broderick & Bascom Rope Co.

Babbitt Metal.
Cleveland Alloys Co.
Fate Co., J. D.
Gerlock, H. W.

Barrows and Trucks.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Chase Fdry. & Mfg. Co.
Fate Co., J. D.
Freese & Co., E. M.
Gerlock, H. W.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Pettigrew Fdry. Co.
Steele & Sons, J. C.
Stevenson Company.
Toronto Fdry. & Machine Co.
Wallace Mfg. Co.
Weller Mfg. Co.
Wellington Machine Co.

Barytes, Carbonate of.
Roessler Hasslacher Chem. Co.

Belts.
American Clay Machy. Co.
Bonnot Co.
Ceramic Sup. & Cons. Co.
Freese & Co., E. M.
Gandy Belting Co.
Main Belting Co.
Manufacturers Equipment Co.
Sawyer Belting Co.

Belt Conveyors.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Ceramic Sup. & Cons. Co.
Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Gandy Belting Co.
Link-Belt Co.
Main Belting Co.
Manufacturers Equipment Co.
Weller Mfg. Co.

Belt Dressing.
Cling-Surface Co.

Belt Fasteners.
Crescent Belt Fastener Co.

Boilers.
(See Engines and Boilers.)

Boxes (Corrugated).
Hinde & Dauch Paper Co.

Brick Conveyors.
Bonnot Co.
Brewer & Co., H.
Ceramic Sup. & Cons. Co.
Chambers Bros. Co.
Fate Co., J. D.
Link-Belt Co.
Manufacturers Equipment Co.

Cables and Cableways.
Broderick & Bascom Rope Co.

Cars.
American Clay Machy. Co.
Atlas Car & Mfg. Co.
Bonnot Co.
Brewer & Co., H.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Chase Fdry. & Mfg. Co.
Fate Co., J. D.
Freese & Co., E. M.
Gerlock, H. W.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Pettigrew Foundry Co.
Standard Dry Kiln Co.
Toronto Fdry. & Machine Co.
Trautwein Dryer & Eng. Co.
Weller Mfg. Co.
Wellington Machine Co.
Youngstown Steel Car Co.

Car Movers.
Marion Mach., Fdry. & S. Co.

Cartons.
Hinde & Dauch Paper Co.

Castings.
American Clay Machy. Co.
Bonnot Co.
Chambers Bros. Co.
Gerlock, H. W.
Link-Belt Co.
Manufacturers Equipment Co.
Toronto Fdry. & Machine Co.

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Lehigh Portland Cement Co.

Chains (Steam Shovel).
Woodhouse Chain Works.

Clay Feeders and Mixers.
American Clay Machy. Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Louisville Machine Co.
Manufacturers Equipment Co.
Marion Mach., Fdy. Sup. Co.
Schaffer Eng. & Equipment Co.
Steele & Sons, J. C.
Stevenson Company.
Toronto Fdry. & Machine Co.

Clay Gatherers.
Sauerman Bros.
Schofield-Burkett Cons. Co.

Clay Steamers.
American Clay Machy. Co.
Schaffer Eng. & Equipment Co.

Coal.
Big Creek Colliery Co.

Coloring.
Ricketson Mineral Paint Wks.
Williams & Co., C. K.

Conveying Machinery.
(See Elevators and Conveyors.)

Counters.
Ceramic Supply & Cons. Co.

Crushers and Pulverizers.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Manufacturers Equipment Co.
Wallace Mfg. Co.
Wellington Machine Co.

Cutters, Automatic Rotary.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Chambers Bros. Co.
Crawford & McCrimmon.
Fate Co., J. D.
Manufacturers' Equipment Co.
Freese & Co., E. M.
Marion Machine, Fdry. & Supply Co.
Steele & Sons, J. C.
Wallace Mfg. Co.

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American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Fate, J. D. Co.
Freese & Co., E. M.
Manufacturers Equipment Co.
Webb Wire Works.

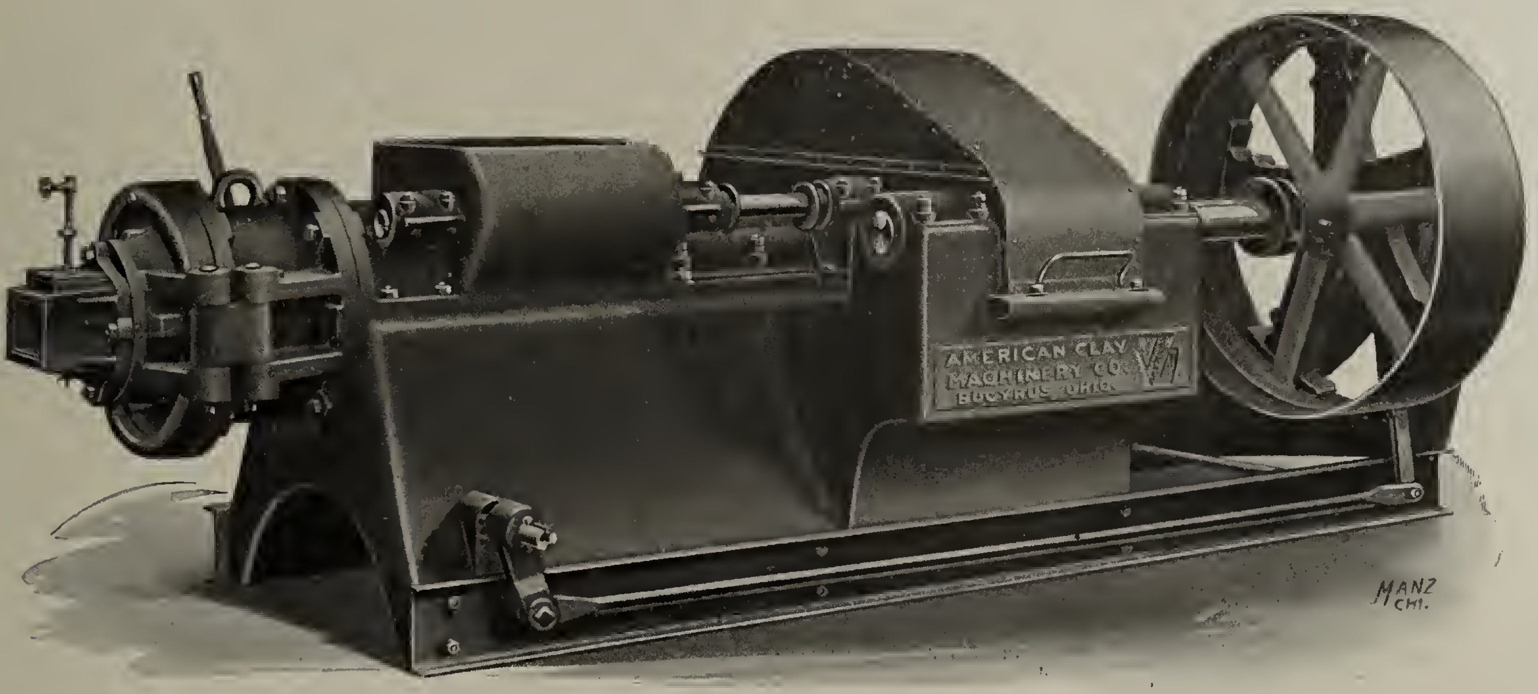
Dies.
American Clay Machy. Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Fate, J. D. Co.
Freese & Co., E. M.
Louisville Machine Co.
Manufacturers Equipment Co.
Nuttall Co., R. D.
Weller Mfg. Co.

Disintegrators.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., J. D.
Freese & Co., E. M.
Manufacturers Equip. Co.
Marion M., Fdry. & Sup. Co.

Door Carrier (Dry Kiln).
Dry Kiln Door Carrier Co.

Drills.
Sanderson-Cyclone Drill Co.

Dryers.
American Clay Machy. Co.
American Process Co.
Bartlett Snow & Co., C. O.
Bonnot Co.
Chambers Bros. Co.
Fate, J. D. Co.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Bucyrus, Ohio, U. S. A.

Much the Largest Manufacturers of Much the Best Clayworking Machinery

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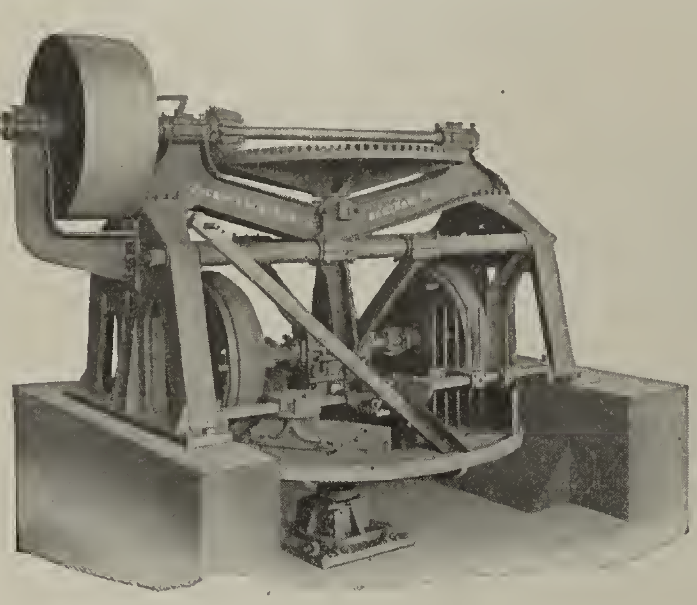

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Jackson & Church Co.
Schaffer Eng. & Equip. Co.

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Fate Co., J. D.
Freese & Co., E. M.
Jackson & Church Co.
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Ceramic Supply & Cons. Co.

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Bonnot Co.
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Cincinnati Frog & Switch Co.
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Martin Grate Co.
Murray Iron Wks. Co.
Smith Co., Claude.
Toronto Fdry. & Machine Co.

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Manufacturers Equipment Co.
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Gerlock, H. W.
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Manufacturers Equipment Co.
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Tecktonius Mfg. Co., E. C.

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Gerlock, H. W.

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Morgan-Gardner Electric Co.

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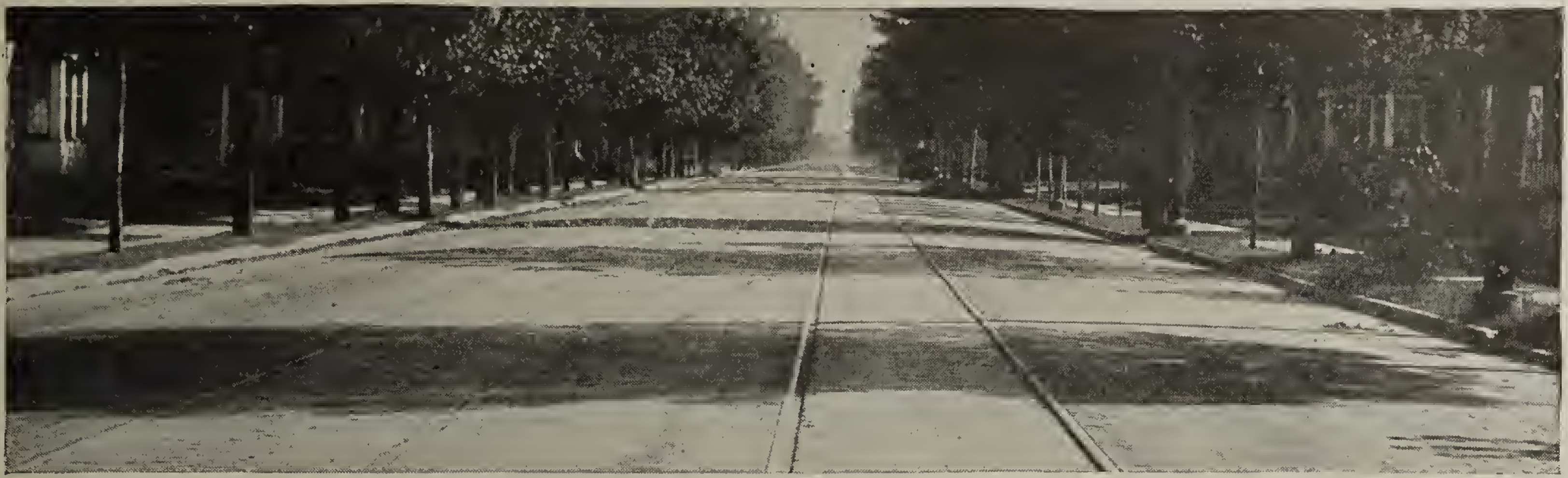
Baldwin Locomotive Works.
Fate Co., J. D.

Locomotives (Steam).
Dewey Bros., Inc.

Lubricants.
Stock Xylite Grease & Oil Co., G. B.



Colfax Avenue, Benton Harbor, Michigan. Brick (Pitch Filled) on old macadam base.

Barrett's PAVING PITCH

Making Brick Pavements Frost-proof

THESE two pavements in Benton Harbor are laid on an old macadam foundation. The long winter, the deep snows and the many frosts of this region make it imperative that the brick pavement with such a foundation be thoroughly protected against damage by frosts, so the joints are filled with Barrett's Paving Pitch.

Cement filler would have caused trouble by expansion and contraction. Sand filler would have let frost get easy access into the foundation. Asphalt filler lacks adhesion in cold weather and would part company with the bricks, leaving chinks through which water and frost could get through. But Barrett's Paving Pitch keeps its grip on the bricks in all weathers and maintains eternally a flexible waterproof seal.

The old macadam foundations are kept as dry as a bone. Damage by frost is unknown. These pavements, therefore, retain their original perfect contour. There are no cracks, no expansion blow-outs, no thrusting up at the curb or against the street car rails; no damage by frost or water.

And Barrett's Paving Pitch will last as long as the pavements.

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Paving brick, sewer pipe, face brick, drain tile, fire brick and fireproofing —all require

Too Much Fuel

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Bonnot Co.
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Manufacturers Equipment Co.
Wellington Machine Co.

Mold Sanders.
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Manufacturers Equipment Co.
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Schurs Oil Burner Co.
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Canton Grate Co.

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Jackson & Church.
Manufacturers Equipment Co.

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Cincinnati Frog & Switch Co.
Lakewood Engineering Co.
Toronto Fdry. & Machine Co.

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American Clay Machy. Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Freese & Co., E. M.
Manufacturers Equipment Co.

Recording Gages.
Brown Instrument Co.
Ceramic Supply & Cons. Co.
Price Electric Co.
Taylor Instrument Companies.

Represses.
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Bonnot Co.
Ceramic Supply & Cons. Co.
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Lakewood Engineering Co.
Steele & Sons, J. C.

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Manufacturers Equipment Co.

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Freese & Co., E. M.
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Weller Mfg. Co.

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Manufacturers, Dealers, Architects and Builders are invited to inspect a large display of this up-to-date material at the Complete Building Show at Cleveland, Ohio, February 16th to 26th. Browns, greens and mingled shades will be shown.

Design, Method of Manufacture, as well as the Machine for producing this brick are covered by United States patents

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BUFFVILLE, KANSAS

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Thew Auto. Shovel Co.

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Steele & Sons, J. C.
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Lakewood Engineering Co.
Manufacturers Equipment Co.
Steele & Sons, J. C.
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Weller Mfg. Co.
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Manufacturers Equipment Co.
Standard Dry Kiln Co.

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A SCIENTIFIC MIXTURE
It REMOVES BOILER SCALE Absolutely
It enables you to hold constant pressures with less fuel and less risk. The cost is low —Write today.
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"Wright" HIGH SPEED STEEL HOIST
"Wright" STANDARD SCREW HOIST
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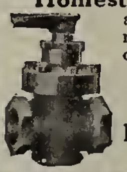
May we send catalog?
Wright Manufacturing Co., Lisbon, O.

Homestead Straightway Valves



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Homestead, Pa.

NUGGET (FITS YOUR LADLES) **BABBITT**
For every bearing on the plant.
It costs but 15 cents per pound.
One hundred other brickmakers buy it, use it, like it, and stock it.
What is your address?
The Cleveland Alloys Co., Cleveland, Ohio

Rebuilt Machinery
Thew Revolving Shovels
Dump Cars Locomotives
Industrial Track, Hoists—Cable, etc.
Write
Moore Bros., 320 New York Life Bldg., Chicago

Taylor Mesaba Steam Shovel Chain
Strictly hand welded by expert workmen and made from a special rerolled double refined iron.
Sizes carried in stock for immediate shipment: ⅞, 1, 1⅛, 1¼, 1⅜, 1½ and 1⅝ inches.
S. G. TAYLOR CHAIN COMPANY
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Machinery and Supplies for Brick Yards and Clay Mining. Shafting, Pulleys, Hangers, Belting, Wire Rope, Roofing Materials. Fire Brick.
All kinds Repair Work done promptly.
Engines, Boilers, Tanks, Stacks, etc.

The Garnet Process
Belt Treating Products for
BRICK AND CLAY PLANTS
Sure in its preserving and proofing quality.
POSITIVE PULLEY CONTACT.
Clean, Economical, and Satisfaction Guaranteed.
Advise your requirements and kind of belting used, in letter today to
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The Wise Man of FATE

Sometimes hollow block manufacturers have a tender clay—or they require an absolute sure-fire straight cut to their ware.

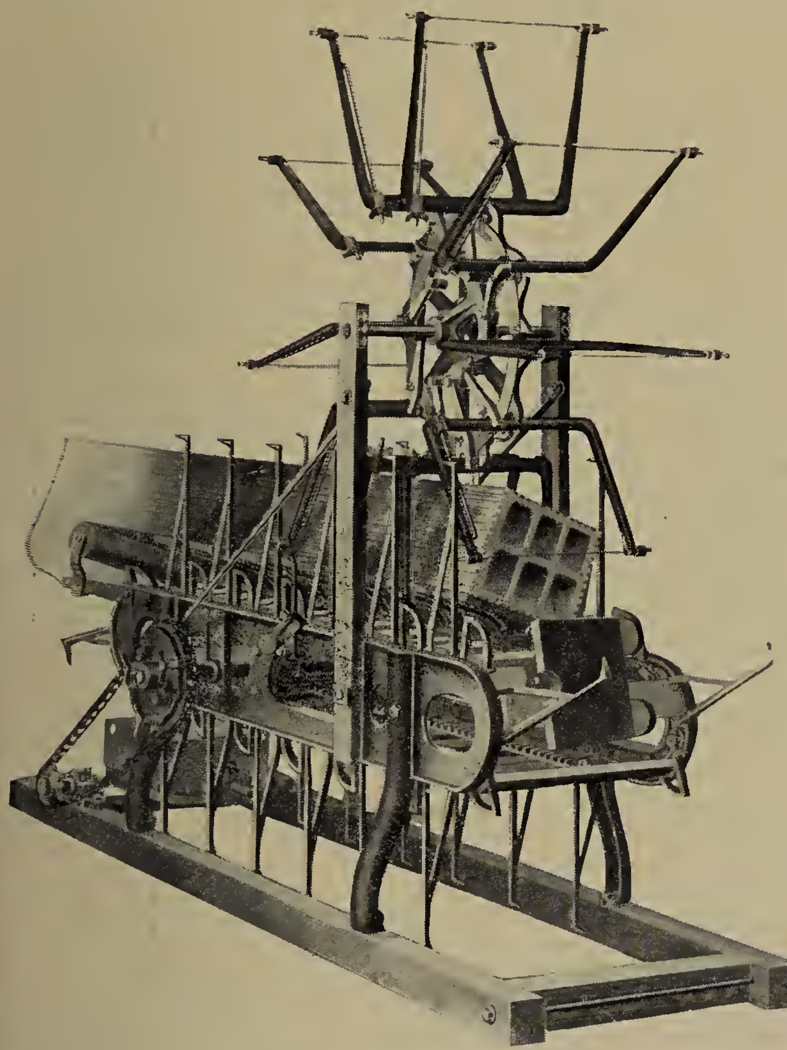
This is particularly true in fire-proofing, in conduit and similar ware, especially if the clay is "cranky."

The Fate Special Automatic Cutter

Is Perfect for This Work

All of Fate's Automatic Cutters long have held the supremacy and for the various purposes they are intended no manufacturer has been able to market a machine that equals any of the Fate cutters.

This Special Automatic Hollow Ware Cutter is one of the latest Fate machines and is offered with the experience of the largest automatic cutter makers back of it.



It Makes an Absolutely Straight Cut

By a special arrangement of the cutting platens one corner of the hollow block is elevated, making a shear cut possible by the cutting wire and thus reducing to the minimum the possibility of the wire breaking down the outside walls or the inner partitions. A very fine wire, making a nice, clean cut, is also possible. With tender clays this eliminates a very serious handicap in most ordinary cutters.

There is No Lost Motion

Another Fate improvement on this machine is the friction arrangement provided for on the cutting reel. The cutter arms have a cam arrangement and the movable platens are controlled by a friction attachment.

This combination practically eliminates all lost motion within the table and insures an absolute straight cut.

Better Learn About this Machine And Other Fate Products

We have a folder that gives you a full description of this and other Fate Automatic Cutters for all sorts of ware—brick, sewer pipe, drain tile, etc. We will take pleasure in sending you a copy upon request.

Let Fate's Experience Help You

We make practically everything used by the clayworker and our various departments of service are at your disposal in any of the problems that confront you. Give us a frank statement of your needs and let us make you a proposal—no obligation to you.

Get a Fate Folder

There is Fate folder or catalogue for every machine and device we make and a copy of any or all are for the asking. Better send for your copy today—it costs nothing to investigate.

USE COUPON

There is a special coupon at the right—with little squares for you to check off the items you are interested in. Fill this out, tear off and mail it today while the matter is fresh in your mind. It's an easy way for you to investigate.

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The J. D. Fate Co., 240 Riggs Avenue, Plymouth, O. We are interested in the following items and wish you to show us how your Full-Measure Service will benefit us—this request not obligating us in any manner.

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- ☐ Hollow Ware Machinery.
- ☐ Conveyors.
- ☐ Crushers.
- ☐ Elevators.
- ☐ Clay Feeders.
- ☐ Disintegrators.
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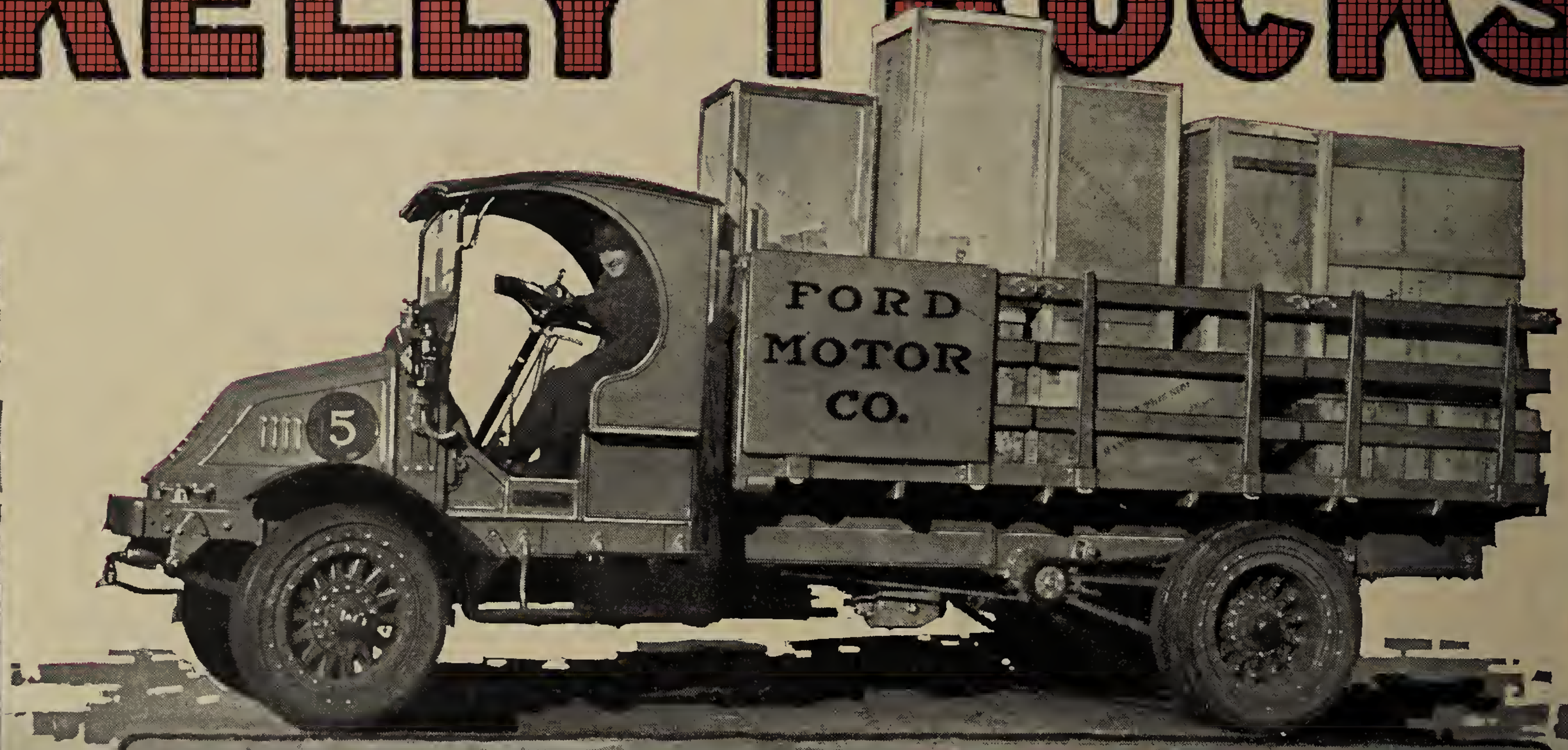
KELLY TRUCKS



Ford Hauls with Kelly Trucks

The Ford Motor Company, Detroit—pioneers in the standardization of units—have standardized their heavy hauling equipment with KELLY TRUCKS. The illustration above shows one of their 5-ton trucks. They also use Kellys of 3½-ton capacity.

Their knowledge of what is best in material and construction; of what constitutes really practical, efficient and economical truck service, is represented in this selection. It means a lot to you—to every manufacturer who has trucking or transportation problems—to know that there has been an authoritative verdict given on the KELLY.

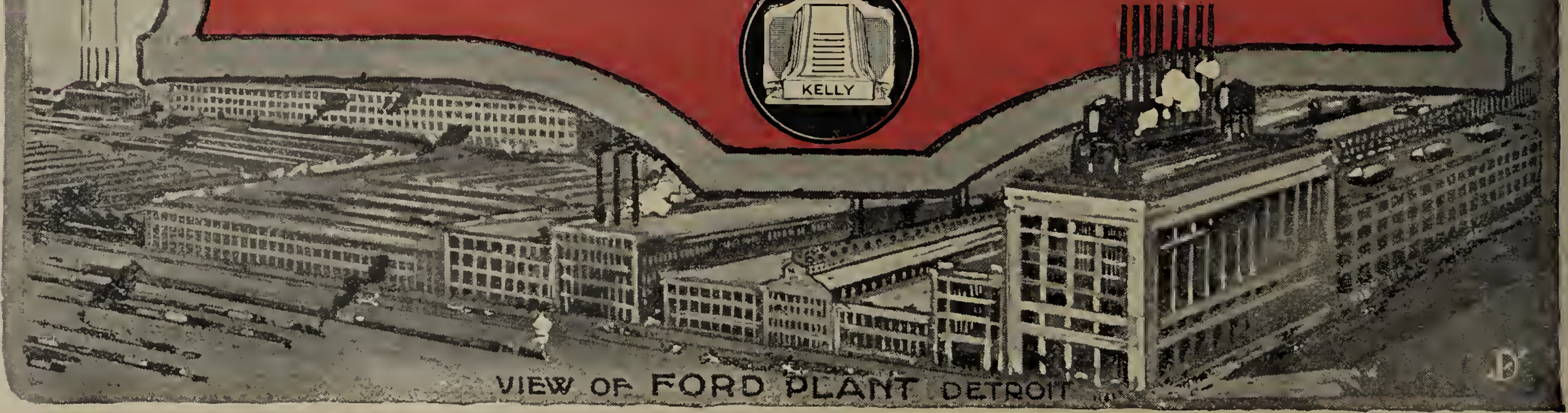
Investigate the KELLY TRUCK as the Ford Motor Company did. Study it in detail. Compare its working capacity, strength, power, flexibility, durability, with any other truck. Note its distinctive utility-increasing features—the special excellence and completeness of the KELLY organization.

"Like Kelly Does"—FREE

We want to put your name on the free list of this valuable monthly publication devoted to truck tranportation. Full of useful information for all truck users.

THE KELLY-SPRINGFIELD MOTOR TRUCK COMPANY
1202 Burt St., Springfield, Ohio

The Complete Line
1½-2½-3½-4-5 and 6 Tons


VIEW OF FORD PLANT DETROIT

BRICK *and* CLAY RECORD

Link-Belt Silent Chain

30 H. P. Pug Mill Drive

Main Drive—Ohio Valley Clay Co.

THE IDEAL DRIVE FOR
CLAYWORKING MACHINERY

Flexible as a Belt
Positive as a Gear
More efficient than either

Learn all about its many advantages, and apply them to your own particular case. Our 112-page Data Book No. 125, and Special Book No. 94 tell an interesting story. We will send both postpaid on request.

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Vol. XLVIII, No. 4 Chicago February 15, 1916

It makes no difference

whether you want to screen your material, elevate, store or convey it or transmit power to various units

When you want any such equipment, there is just one place to send your orders and more Brick and Clay Workers are finding this out every day.

You may fool them once but when they keep sending repeat orders it proves that you are treating them right.

SPECIFY WELLER-MADE INSIST ON

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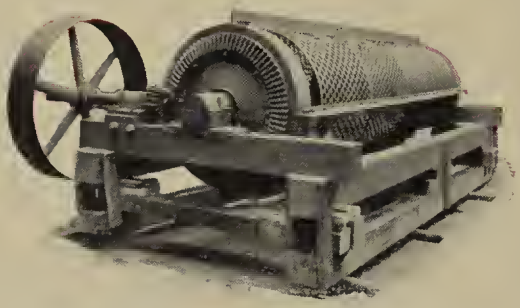
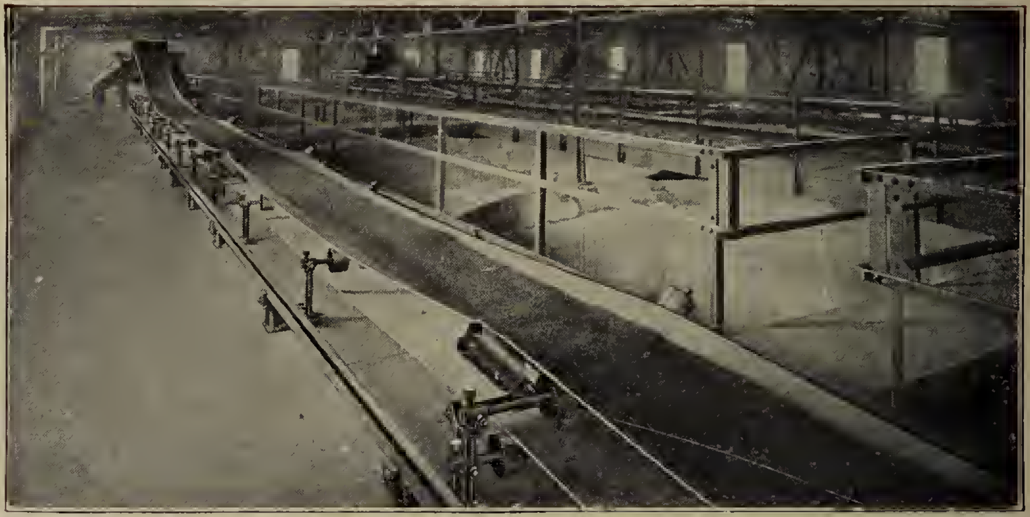
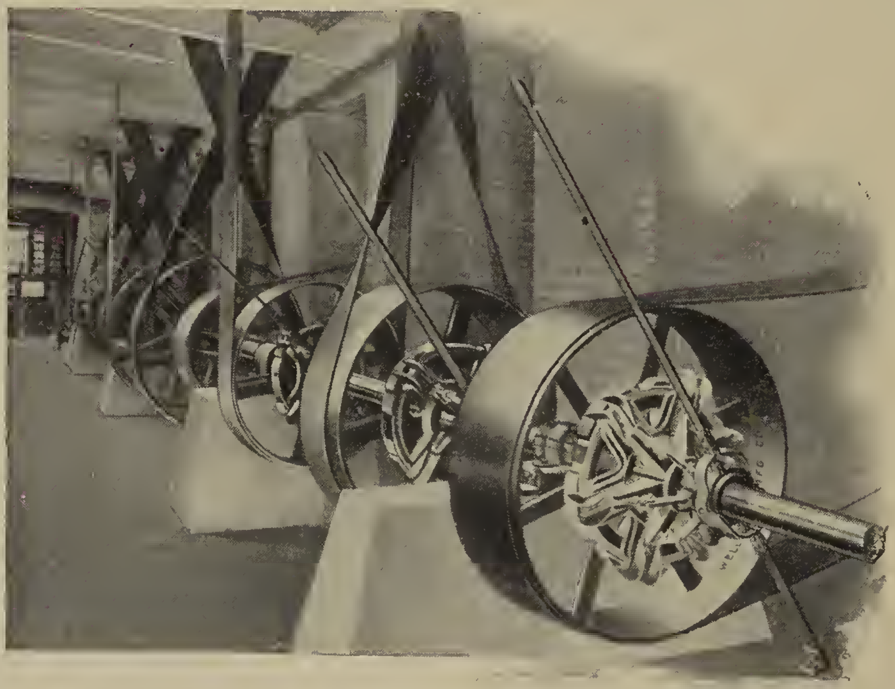


Revolving, Shaking or Stationary.



Belt Conveyors—Storage System.



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Elevators. Any Material—Any Size.

Elevating, Conveying and Power Transmission

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Entered as Second Class Matter January 2, 1911, at the Post Office, at Chicago, Ill., Under the Act of March 3, 1879.

Terms of Subscription
One Year—(24 Numbers)
United States......$2.00 Foreign $3.00
Single Copies.......25c

Published the first and third Tuesdays of each month by

Kenfield-Leach Company
445 Plymouth Court Chicago

Chicago, February 15, 1916
Vol. XLVIII No. 4

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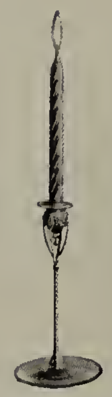
Standards of Practice for Business Publications

The publisher of a business paper should dedicate his best efforts to the cause of Business and Social Service, and to this end should pledge himself: 1. To consider, first, the interests of the subscriber. 2. To subscribe to and work for truth and honesty in all departments. 3. To eliminate, in so far as possible, his personal opinions from his news columns, but to be a leader of thought in his editorial columns, and to make his criticisms constructive. 4. To refuse to publish "puffs," free reading notices or paid "write-ups;" to keep his reading columns independent of advertising considerations, and to measure all news by this standard: "Is it real news?" 5. To decline any advertisement which has a tendency to mislead or which does not conform to business integrity. 6. To solicit subscriptions and advertising solely upon the merits of the publication. 7. To supply advertisers with full information regarding character and extent of circulation, including detailed circulation statements subject to proper and authentic verification. 8. To co-operate with all organizations and individuals engaged in creative advertising work. 9. To avoid unfair competition. 10. To determine what is the highest and largest function of the field which he serves, and then to strive in every legitimate way to promote that function.

The EDITOR'S CORNER

Comment, Criticism and Advice on Live Issues Affecting the Manufacture, Marketing and Manifold Uses of Burned Clay Products



MODESTY is an estimable quality—under some circumstances. There are times, however, when it works to the injury of the man who possesses it in a very large quantity.

A great part of the clayworking industry is engaged in manufacturing commodities that are designed for use in building construction. Wherever they are used, they add to the fire-safeness (to coin a word) of the community and in much greater degree than any other kind of building material used for the same purpose.

As a consequence of this, every new building code that is drawn and which looks to safer buildings—not only from the standpoint of fire-hazard, but of structural safety as well—is drawn in favor of burned clay.

Growing cities extend their fire-limits, increasing the territory in which it is forbidden to build more than a certain height in frame—in many cases, to build with frame at all.

And this legislation, thru its limiting the use of wood, automatically increases the demand for burned clay.

Who is responsible for the fire-safety idea in building construction? As a rule it is one man, or a group of men who act from conviction, serving the citizens at large and—in many instances—with little thanks.

Do we find, in a group of this kind, the maker of building brick? Do we note the presence and feel the influence of the man who makes hollow clay tile? Does the man who owns a roofing-tile plant contribute his mite of information and, perhaps, financial support necessary to secure the services of competent engineers and statisticians to prove that the cheap wooden shingle is less economic than the heavier clay tile?

Or do we find that these men of clay stand back, unwilling to be so prominently identified with a movement that is for the general good—merely because they will be suspected of being biased in favor of burned clay, and therefore open to suspicion?

Modesty, as was said, is an estimable quality. The man who owns the saw-mill or the lumber yard, however, seldom lets *his* modesty interfere with *his* business, when a building code is under consideration. He knows that "codes" limit his sales, and he very frankly marshals his forces, and puts all of the obstruction he can in the path of safe-building progress.

But he manages to remain, strange as it may seem, a very much respected member of society, even tho his work against the safe building legislation *was* tinged with self-interest.

Is there any particular reason why the fact that a man makes an unburnable product should make him any the less anxious that the community in which he lives be made fire-safe?

Is he going to keep on letting someone else constantly do for him the very things he ought to do for the good of his city and for the *good of his business?*

"With Apologies"

AN APOLOGY, colloquially speaking, implies that the one who makes it is asking pardon and virtually promising not to "do it again." An apology, philosophically speaking, is a defense argument. The one who makes an apology in the sense of asking pardon may be called an apologizer. The one who makes an apology which is a defense, may be called an apologist.

Are the men who make burned clay building materials apologizers or apologists? Their business exists—why?

Does it exist entirely as the result of a demand—the demand of civilization for some safe protective building material, or because the men who make that material have created all or any part of that demand?

If the latter, let some apologist for the burned clay building material industry come forward and tell how, and when and where this has been done.

If, on the other hand, the industry exists by the grace of a demand created by a recognized need for its products, then the industry needs an apologizer of more than usual eloquence.

To the insistent demand which comes from a people only *beginning* to realize that the safety of its home life is endangered by flimsy building, is added the knowledge that is fast taking hold upon the minds of thinking men—*the knowledge that the tremendous waste of fire is secondary to the greater wastage due to the rapid decay of wooden buildings* and the burden of partial protection to this kind of property improvement—the protection that comes thru painting and constant repair.

The tax to which we are subjected, thru this burden of fire-loss, of decay and repair to flimsy buildings is rapidly becoming a menace to our much vaunted national prosperity. Were we not blessed with natural resources that are altogether unique in the history of nations, we would long since have been a bankrupt people—impoverished by the extravagance of waste.

What shall be said of the men who, having the power to alter this condition and check this waste, withhold their hands from the doing of those things that are necessary to the end? And who has the power, more than the men who make the material that has been described as defying fire and frost and flood and time itself?

Service

THE GREATEST telephone company in the world advertises that a careful analysis of public needs—present and future—enables it to give the service that is its first claim to universal recognition.

What analysis has the maker of burned clay building materials given the public need—either present or future? What has he done to develop his industry in its power to serve those needs? Service is the large word written across the face of modern business. How can this service be rendered if its demands be unknown?

Can you truthfully say that *your* service, as rendered today, is the best that could be given, seeing that it is given without a true knowledge of public need? And if that be true of today, what of tomorrow?

Intelligent analysis will point the way to double service and triple dividends. And a part of that intelligent analysis is the employment of engineering skill and knowledge and reputation to the end that burned clay may be *known* to be what it is *said* to be—the best of all building materials.

Research work will give designers and engineers data which, in turn, will enable them to use burned clay economically and with scientific exactness. Comparative costs—initial and of maintenance—will be published and taught.

And the teaching will not be confined to the builder of a single small home—it will extend to the men who, by a stroke of the pen, decide upon millions of dollars' worth of building materials.

When the true service value of different materials becomes known, the makers and layers of burned clay materials—the men behind the power-plant and the men behind the trowel—will have a clearer conception of their value to the nation. Then, and not until then, will they take their places as the leaders in the building of America.

Publicity

HOW MANY clayworkers, do you suppose, make any effort to help their business by legitimate newspaper publicity? How many, do you suppose, have a speaking acquaintance with any one of the editors?

How many clayworkers were impressed with the importance of the article which appeared in a recent issue of this magazine, under the title "Fully Covered by Insurance."

It protested, you may remember, against the common practice of newspapers—that of running the words "Insured," or "Partially Covered by Insurance," or "Fully Covered by Insurance" in close juxtaposition to the fire-loss figures that are printed every day or every week or every month, according to how frequently the paper is published.

Carelessness—careless building, careless storing of inflammable materials, careless exposure of gas-flames, electrict-light wiring, matches, oily waste and a hundred other fire-promoters—these are the things that breed fires. And the idea that fire insurance covers fire-losses breeds carelessness.

Don't you think your editor would be interested—if you called his attention to these facts?

Cost Accounting

SO MUCH has been said and so much written regarding the beneficial results of uniform cost-accounting, that every paper read or written on the subject should start from the point where a system is described—and so diagram and chart it that it can be easily understood.

All of the preliminaries—the words wasted on the subject of the advisability of every manufacturer's knowing how much his material is costing him, and how much good would be obtained thru the use of some system that would permit of comparison between the varying costs at different plants—these could well be omitted.

The one great drawback about an intelligent and therefore uniform cost-accounting system is that the fundamental principles of cost-accounting are, as yet, unknown quantities to ninety per cent of the manufacturers of brick and hollow-tile.

A perfect cost accounting system is something that must be grown—like whiskers. It cannot be bought ready-made, like a wig or a false moustache and be expected to deceive any one but the man who owns, wears or uses it.

A perfect cost-accounting system is built around an industry, and then adapted to its various units. One manufacturer, who claims to have one which shoots fairly straight, says that it took him two years to get it in shape—and that he had to be on his bookkeeper's neck twenty-four months during that two years.

No cost-accounting system will run itself. Perpetual motion has not, as yet, arrived. It requires the co-operation of one (and generally more than one) man, skilled in accounting. The ordinary bookkeeper will do—if he is a bookkeeper. Generally the ordinary bookkeeper is nothing of the kind.

The same "Buying Well" idea that applies to machinery—and men—applies to buying cost-accounting. It pays to pay an expert to install it. Then it pays to see that it is used and not misused by the men to whom its workings are entrusted.

The installation of a real cost-accounting system in a plant which has had none—or one that is a makeshift—is a serious affair. It means the expenditure of some money, even after the expert is paid, for books and forms and "blanks" that run up the printing bill. And then, after that, it means more work for the bookkeeper—maybe an extra man.

But it pays. Every plant that has installed one, says so. Every plant which works today, under a complete cost-accounting system, has so much faith in the efficacy of that system to keep the plant out of financial danger, that it recommends—nay, urges it, upon its fellow workers.

So what is written here is not to discourage you from putting in a system that will show you where you stand. It is to prepare you for the worst—which is the fact that it will, like everything else worth having, cost you a very considerable amount in the way of an original investment.

A Thank Offering

THE ONLY WAY that an editor of any publication has of knowing that the work he is doing is appreciated by his readers, is by the response his subscription department receives to the invoices sent out, and the renewals that come in.

So it is with considerable satisfaction—a satisfaction deeply tinged with gratitude—that the editor of "Brick and Clay Record" meets the report that has come to him from *his* subscription department as to the receipts for the year that has just closed, as well as the first six weeks of the new year—Nineteen Sixteen.

Reflecting, perhaps, the renewed activity in all branches of clayworking, these readers of "Brick and Clay Record," old and new, have made a subscription record that is beyond anything the magazine has known in twenty-two years.

The support thus given demands appreciation. This appreciation will be shown in the better service that will be given by "Brick and Clay Record" in the future—a service that is largely made possible by the promptness with which its subscribers have indicated their desire to still be numbered among its readers.

CLEVELAND'S SCHOOL

The Wigmore Coliseum, Cleveland, Ohio

RALPH P. STODDARD
General Secretary, First Complete Building Show

WITH EVERY INCH of floor space taken and belated exhibitors offering premiums for opportunities of presenting their wares, the First American Complete Building Show enters the last days of its preparatory period as "Brick and Clay Record" goes to press.

That it is a financial success is now beyond doubt. Every promise indicates that as an educational factor in the home building of the country, it will be more than a success—rather a revelation.

More than two hundred exhibits, each having for its object the purpose of answering a problem in building, an architectural exhibit that will include hundreds of plans for low priced houses, working demonstrations of hundreds of modern devices and labor-saving equipment for buildings—these are but a few of the things that will attract the visitor.

Nearly every man looks forward to the day when he can either buy or build a home. Many who have built, even during the past few years, have regretted their lack of knowledge as to the essential features of home building. Had a "complete building show" been held in Cleveland or in any other large city ten years ago, many building errors would never have been committed.

The First American Complete Building Show will open Wednesday, February sixteenth, when Cleveland's popular mayor will press the button that starts the unusually large number of moving exhibits.

So much has been said in previous issues of this and other magazines, relative to the men who were responsible for this show and who backed up their good opinion of the material men of America by very substantial financial support, that nothing further need be said here. But —this, the last announcement of the First American Complete Building Show would be like a story without a hero did it not mention Ralph P. Stoddard, the general secretary and altogether live-wire of the proposition. To him, and to his untiring energy, coupled with an immense capability for continuous hard work, a great tribute should be paid and it will be, not only in the throngs that will crowd the Coliseum in Cleveland from February 16 to 26, but in the impressions that will be made upon this myriad-minded assemblage so largely made up of those who will

CASPER P. MAYER
President, National Brick Manufacturers' Association

for BUILDERS

Most Comprehensive Educational Exhibit Ever Held in America Opens its Doors in Cleveland, Ohio as This Issue of "Brick and Clay Record" is Delivered to its Readers

make use of the knowledge they gain while attending the exposition that is so much a child of his brain.

The fact that manufacturers of burned clay building materials will be largely represented among the exhibitors will make Cleveland a Mecca for clayworkers during the ten days that the doors of the Coliseum will be open. This will assure a good attendance at the annual convention of the National Brick Manufacturers' Association, which will be open February 23 and close its session February 25. The official program of this convention has already been published, so needs no repetition here. No effort will be spared to make the three days full of interesting incident, and the convenient location of Cleveland will doubtless tempt many makers of burned clay products to the Sixth City. Headquarters will be at the Hotel Statler.

Another, and very potent attraction will be the convention of the American Ceramic Society, which will be opened during the forenoon of the 21st, also at the Hotel Statler. The sessions will be held in the Lattice Room, and the secretary's office will be found there. The convention will close Wednesday, the 23rd. "Section Q" will be a feature, and attendance at this interesting function is something that no ceramist can afford to miss. Sight-seeing trips will be announced after the convention is called to order, and it is promised that the first day's program will be so attractive that anyone who has even thought of spending the holiday at home will feel guilty for having even harbored so detrimental an idea.

Cleveland is the "home city" of the Society Advocating Fire Elimination, and during the week of the conventions, it would be well for clayworkers to stop in the office of this association, which is in the Leader-News building, and come into closer touch with a movement which has for its object the promotion of fire-safe building construction. Originally organized by building material concerns located in Cleveland, this association has grown in power and scope until its membership represents nearly all of the larger cities in the country. When you are made to see the work that is being done and how much that work favors burned clay, you will, without doubt, arrange to have your name enrolled as another clayworker willing to support with deeds, rather than words, better building and better building materials.

THEODORE A. RANDALL
Secretary, National Brick Manufacturers' Association

The Hotel Statler—Convention Headquarters

Here in Cleveland, also, will be found the headquarters of the National Paving Brick Manufacturers' Association, an organization which has for its object the promotion of brick-paved highways. Some day, it is expected, this association will have a building of its own. At present it is located in the building owned by the Brotherhood of Locomotive Engineers.

Manufacturers of hollow building tile will find a hearty welcome awaiting them at the offices of the Hollow Building Tile Association, of which Charles T. Harris is secretary, and which has its offices in the same building as houses the paving-brick men. Much information can be obtained here as to the work, aims and hopes of this association—one that deserves the support and co-operation of every maker of hollow clay tile.

Ample opportunity will be afforded visiting clayworkers to see some of the best equipped plants in the country, while the conventions are in progress. Arrangements have been made to allow time to the delegates and visitors to see, in Cleveland's clayworking plants, the most up-to-date methods of producing a variety of clay wares, paving-brick, hollow building tile and building brick plants being as thick in Cleveland as flies in a country hotel dining room.

Altogether there will be plenty to attract the attention of those who go to Cleveland to attend either the conventions or the First American Complete Building Show, or both. It ought to be an epoch-making week in the realm of burned clay.

Nor will Cleveland be found lacking in attractions of a social kind. The night-life of America's Sixth City is exceptionally interesting. Its theatres are modern, and "play" all of the metropolitan successes. Its parks are known from one end of the country to the other. Its roads are the best paved of any of our cities. Its hospitality is proverbial.

The entertainment committee that is working to make the "big" convention a success is made up of men who understand how to make the strangers within Cleveland's gates feel that they are thrice-welcome. Come to Cleveland and test their willingness to give you a good time.

"By Their Signs Ye Shall Know Them"

NATIONAL PAVING BRICK MANUFACTURERS ASSN.
NPBMA
Pave with Brick

A design for a new emblem which is to appear upon the stationery of the National Paving Brick Manufacturers' Association and its members, is shown herewith. As the association is rapidly becoming known thruout the country as an institution that is working for the development and extension of good brick roads, it is no more than fair that the identity of the supporters of this movement should be disclosed as an encouragement to new members and a discouragement to "slackers."

In addition to being used upon stationery, this design will be worked into a blue and gold button which will decorate the coat lapels of the members.

The association has arranged to supply lantern slides showing the manufacture of paving brick and the construction of roads for the extension course in highway engineering to be conducted by the University of Tennessee during February and March. Charles E. Ferris, Dean of the College of Engineering at this school, will show these slides during his lectures at Knoxville on February 16, at Nashville on February 23 and at Jackson, Tenn., on March 3. These slides are being used for similar purposes at various other points in the country and are factors in furthering the cause of good roads.

Announcement is made by Secretary Blair of the entertainment that will be accorded paving-brick manufacturers and their friends who attend the Complete Building Show and the N. B. M. A. Convention to be held in Cleveland this month. This entertainment will take place in the banquet hall of the Hotel Statler on the evening of February 22, and will be featured by short addresses on the present condition and future prospects of the paving-brick business.

Making Real Craftsmen of Bricklayers

The Mason Builders' Association of Minneapolis, working in conjunction with the Builders' Exchange of the same city, has made arrangements with a local educational institution whereby apprentice bricklayers employed by the Minneapolis contractors, are to be paid for attending school for the purpose of becoming experts in bricklaying and masonry.

A tentative course of study has been outlined which provides for practical instruction in brickmaking, concrete mixing and in the properties of cement; following this the exact values of lime, sand and cement will be studied, so that mortar mixing will become more of an exact science to these apprentices than it has been in the past or would be under the ordinary construction methods.

Brickmaking in all of its branches will be taken up and the strength of brick piers, as well as those of reinforced concrete, will be closely studied. The use of hollow tile fireproofing will also be demonstrated so that when these apprentices have finished the course, they will be competent to qualify as experts in the materials that enter into masonry construction as well as in the actual use of these materials.

The entire course will require a part of three years, the students attending school in January and February of each year, when they will be required to go to school five days each week. During this time they will be given half of their regular pay by their employers. In case of excused absence, they will lose the pay for the time that they are not present and in class, but in the event of unexcused absence a fine, double the amount that would have been paid the student had he attended, will be entered against him.

Wherever it is possible to do so, this pay will be withheld until the end of the course, at which time it will be given to the student in a lump sum.

This experiment—for it is little better than that—will be watched with a great deal of interest by master builders in other cities. It is a known fact that the present method of apprenticing does not produce skilled labor. The older bricklayers, masons and carpenters are better workmen than the new generation. The object of the average apprentice is to "learn the trade" so that he may, as soon as possible, work and receive journeymen's wages. He does not know, and as a rule does not care, what kind of material he is using or what his work represents in strength and durability. The "man on the wall" of the new type is the last man to protest against the use of inferior material—his work consists of doing a certain task in such a way as to satisfy his foreman.

The master builders of Minneapolis are far seeing. Business efficiency, factory management, plant economy and all similar recent movements in various lines of endeavor have for their object the giving of a better service. The building trades must follow and a great deal of the success of the builder of tomorrow will lie in his ability to put skilled workmen on his walls.

You Owe "Brick and Clay Record" a Call

Don't forget to pay it while you are in Cleveland, attending the First American Complete Building Show and the N. B. M. A. or A. C. S. conventions. "Brick and Clay Record" will have its headquarters at the Hotel Statler, in room 341. Don't forget the number—341—and don't forget to come in and see "Brick" people *the first day* of the N. B. M. A. convention, which is the 23rd.

The last remark is in the way of a hint—a whispered word of advice in your ear. And for fear you did not hear it we will repeat it—*don't forget to come to room 341 at the Hotel Statler the first day, which is the 23rd., and come early.*

Coming Conventions

Feb. 17, 18, 19..........National Builders' Supply Association..................Hotel Statler, Cleveland, Ohio.

Feb. 21 to 23.........American Ceramic Society, Cleveland, Ohio.

Feb. 23 to 25.........National Brick Manufacturers' Association.........Hotel Statler, Cleveland, Ohio.

Feb. 22 to 25.........American Road Builders' Assn................ Pittsburgh, Pa.

Feb. 23 and 24.........Western Ontario Clay Workers' Association.........London, Ont.

DIGGING DOLLARS *from the* CLAY BANK

How a Drain-tile Manufacturer is "Cashing In" on a Central Pit and Clay Station which Serves Four Large Plants

The Above Illustration Shows the Steam Shovel, Which Has an Extra Heavy Boom, at Work on the Bank

From the Shovel, the Clay is Transported in Cars to the Foot of the Hoist at the Centr. Station Building Shown Here

THAT THE OPERATION of large clay plant units offers unparalleled opportunities for cost reduction has been well demonstrated by the Mason City (Ia.) Brick and Tile Company which consists of about seventy-five kilns, including five separate plants, all in Mason City.

Four of these, known locally as sewer-pipe plants Nos. 1 and 2, the drain-tile plant and the clay works, are so located as to make a central station for grinding and mixing the clay practical and economical—an arrangement that insures a uniform product from each of the plants. It might be mentioned in passing that the names of these plants, as given above, are slightly misleading and somewhat ambiguous as to the exact nature of the ware which they manufacture. The sewer-pipe plants, so called, make large and small drain-tile and some hollow-tile; the clay works makes various kinds of hollow-ware, but mostly drain-tile, while the drain-tile plant lives up to its name and devotes most of its capacity to the manufacture of that product.

There are two pits on the property of this

The Last Stage in the Work at the Central Station. A Loaded Car of Ground Clay Leaving for the Plant at Which it Is to be Used

company, the central and largest one being within a quarter of a mile from each of the above mentioned plants, with the exception, perhaps, of the clay works, which is about a half-mile distant.

A central station building, with eight-inch walls of hollow-tile, has been erected on the east side of the pit. A picture of this building may be seen in the accompanying illustrations. Here, heavy grinding machinery and a system of conveyor belts prepare and distribute the clay to the cars for the various plants with a simplicity and exactness that is refreshing to the engineer to whom the all-too-common haphazard methods of preparing clay are a familiar sight.

The rock-like shale and softer surface clay are gathered at one end of the pit, the former by a steam shovel with an extra heavy boom and the latter by an electrically operated drag line excavator of an unusually large type. On the drag line there is a 440 volt, A. C., seventy-five-horsepower motor for hoisting and a twenty-two-horsepower swinging motor. The drag line is equipped with air brakes and a one and one-half yard bucket. The steam shovel has a bucket with a capacity of one and one-quarter yards. The drag line, in stripping off the surface clay, dumps a sufficient quantity over the bank to permit a mixture of thirty per cent clay and seventy per cent shale, which is made by an experienced operator on the shovel. The unused clay is loaded into dump cars by the drag line, which are hauled away and deposited at the rear of the pit as sort of a fill.

As the clay cars down in the pit are filled by the shovel, they are hauled around to the foot of the hoist at the central station by mules, where they are picked up by a cable and pulled over a trestle to the top floor of the building to enter the grinding process preparatory to being sent to the various plants. These cars have a capacity of two yards each.

Two large granulators, which crush the shale and clay to a medium fineness, receive the contents of the cars as they are brought into the building. These granulators are operated by two 2,300 volt, A. C., 100-horsepower motors, which also furnish the power for the rolls. The mixture, as it is ground, is moved by the knives to the discharge end of the granulators where it is passed between a set of cylindrical rolls. These rolls separate the pebbles from the mixture, which we shall hereafter, for the sake of simplicity, call clay, and discharge them thru an iron chute to a dump pile on the east side of the building. From these first rolls, the clay passes thru another set of rolls placed closer together, and from thence thru a hopper onto a reversible belt conveyor twenty inches wide, which discharges into a system of hoppers at either end of the belt. At one end these hoppers discharge in turn into cars bound for the two sewer-pipe plants and for the clay works. At this point there is also a hopper which empties onto an inclined belt conveyor twenty-two inches wide. This conveyor discharges onto another belt conveyor running at right angles and

The Electric Drag-line, Which Strips the Surface Clay from the Top of the Bank, in Operation

An End View of the Storage Shed, With a Part of the Central Station Building and the Iron Chutes Which Discharge the Tailings, Appearing on the Left leading to the storage shed which is a part of the central station. At the other end of the reversible belt first mentioned, there is a hopper which discharges into cars bound for the drain tile plant. This conveying machinery is operated by a 2,300 volt, A. C., twenty-five-horsepower motor, the belt leading to the storage shed being operated by a separate seven and one-half-horsepower motor.

The storage shed is a long, low structure extending at right angles from the central station building. It is covered with ingot iron and so protected as to be frost-proof. The shed has a capacity of six thousand tons of ground clay.

The last link in the chain of conveyor belts which carry the ground clay into the storage shed, operates on an overhead platform extending the entire length of the shed. A movable belt tripper permits the clay being distributed from the conveyor to any point in the shed. The platform has removable sections two feet wide on either side of the belt which are taken up at the point where it is desired to discharge the clay from the belt. The tripper is mounted on rails over the conveyor and by throwing in a clutch, the moving belt can move the tripper to the desired location, where it is clamped to the rails to make it firm while discharging clay. The shed is heated by steam, ten one-inch pipes being placed on either side of the building half-way between the roof and the floor.

When the pit is open and the central station is mixing clay faster than needed by the four plants, the surplus is directed into the storage shed, so that when the pit is forced to close on account of bad weather, a severe snow-storm or blizzard, the clay is reclaimed from the shed by a system of conveyor belts, thus making it possible for the plants to operate to capacity thruout the entire year no matter what weather conditions may prevail.

The first division in the reclamation system is a conveyor located beneath the floor of the storage shed. Removable sections permit the loading of the ground clay onto the conveyor, which discharges at the foot of an elevator conveyor in the central station building. There are fifty-six buckets on this elevator, each having a capacity of seventy pounds of material. The elevator box is thirty-eight feet square and forty-six feet high. The elevator discharges over its head into a large hopper which in turn empties onto the reversible belt mentioned earlier in this article. From thence it passes thru the same channels as does the raw clay from the pit which is discharged onto this belt from the crushing rolls.

The cars of prepared clay travel in three different directions from the central station, a hoisting drum and cable in each of the plants being used to draw the cars. When the clay reaches the plant to which it is directed, it is reground and put thru another process of preparation before going to the machines—a method which gives rise to the claim of this company that it produces double-process ware.

There are some features of the pit which have not as yet been mentioned, but which are unusual. It is drained by a network of tiling from six to fifteen inches in diameter. These drains discharge into two sumps, one ten feet and the other eighteen feet in diameter. Four-inch and six-inch centrifugal pumps, electrically driven, remove the water from these sumps, discharging it into pipes leading out of the pit.

A Side View of the Storage Shed

While politicians are legislating against so-called "big business," economists are declaring that the only logical and economical way to conduct business is to consolidate the smaller, wasteful units into larger ones, thereby eliminating much of the useless expense. That the clayworking industry is gravitating toward this end was shown graphically in the last report of the United States Geological Survey covering the year 1914.

No better example of cost-saving in the operation of large clay plant units can be had, perhaps, than this instance, where one set of grinding machinery and one crew of men prepare the clay for four manufacturing units, and where one storage shed is made to serve the needs of a quartet of large plants.

GOVERNMENT MORE LENIENT *to* BUSINESS

Since the enactment by Congress of the Federal Trade Commission Law and the Clayton Law, the Federal Trade Committee of the Chamber of Commerce of the United States at Washington, D. C., has been presented with inquiries relative to the relationship that would be established between the Department of Justice and the Federal Trade Commission at points where jurisdiction seems to overlap. It has also been interrogated regarding the probable attitude of the Department of Justice with respect to future proceedings.

It was explained to the Attorney General by the representatives of the National Chamber that if he would express himself it might be regarded as reassuring to the public mind and at the same time dispel some of the uncertainty which has heretofore existed. The committeemen have had an interview on the subject with the Attorney General.

It is reported that he gave the committee to understand that persons entering into transactions in good faith, having good cause to believe them lawful, will not be criminally prosecuted, but if their business be found violative of the law, they will be given opportunity to readjust in conformity with the law without legal proceedings, unless consent decree in a civil suit is desired. The Attorney General further said:

"In cases where both the Department of Justice and the Federal Trade Commission have jurisdiction, such for example as those arising under the Clayton Act, the Department will await the conclusion of the Commission's proceedings as to any matters in which the Commission's jurisdiction is first invoked."

The "MYSTERY" KILN

Every Yard Has Its "Hoodoo" Kiln, the Burning of Which Produces More Than a Usual Percentage of "Off" Ware. Here Is a Way of Solving this Plant Problem

By H. L. Longenecker

SOME DAY a great detective story will be written around a brick plant. It will be called "The Mystery of the Number Seven Kiln"—or, if the author has a fondness for even numbers instead of odd—"The Mystery of Number Ten Kiln"—or Number Fourteen.

The story will tell of the peculiar action of this kiln—one built at the same time as all, or at least many of the other kilns—and from the same plans. Then, when the kiln is torn down, or blown down by some miscreant, who, for the sake of the dramatics of the situation, will perish in the mass of glowing ruins, there will be found under the floor (or somewhere in the flues or stack) a chest of gold that had been hidden—and which checked the draft.

Meanwhile, and on many plants, the under-kiln work—the flues or the stack *are* stopped up, and there is something very like a chest of gold awaiting the man who will pursue his investigations, *so that he knows the under-construction of every one of his kilns, and of the flues that lead to the stack,* and something more than he knows, today, of the stack itself. True, it will not take the form of an iron-bound and copper-riveted chest of doubloons, but it will show up fully as well in the bank account.

There is, or should be, in every clayworking plant, a complete pen-and-ink drawing, or blue-print record of the original flue system of every kiln, and of the flues connecting the kilns with the stack or stacks. How many plants have a complete record of the alterations that have been made in the underground construction by a succession of repairs that have extended, perhaps, over a period of years?

Is it not possible that, in curing the defects at one time or another, conditions have been set up in one or another of the kiln units, that make it, or them, radically different from the other kiln units of the battery? And if so, how is anyone going to solve the "mystery" of this kiln's not burning to the same shade, or the same hardness, or the same percentage of perfect ware as other kilns, even tho the setting is the same, the firing the same and the temperatures within reasonable distance of those maintained in the other kilns?

So, while much has been written about the proper construction of kilns of varying types, and about flues and stacks, and the most economical ways of setting and burning the ware, the little that has been written about kiln up-keep has been signally lacking in one important point, which is that an accurate and graphic record should be kept of even the slightest change that is made in the underground construction.

Nor has the subject of kiln up-keep been given enough thought. When a machine slows up, because of worn bearings, or broken gear teeth, or false alignment, or sinking foundation, it is customary to put in a little night work (if the job cannot wait until Sunday) on getting it back into shape, and delivering its full return for the power that is applied to it. Perhaps it is because the disintegration of kilns so closely resembles the slow and persistent processes of nature that we do not consider the relation of repairs to the coal bill and other manufacturing costs.

In the big power plants, where efficiency methods and modern machinery are producing maximum power at minimum cost, boilers are regularly out of service for cleaning—generally every two weeks, but never less than twelve times a year. This is not a fad or a hobby with the men in charge—it is done because they know it pays, and how much it pays.

Have you ever asked your superintendent or head burner whether he has cleaned a certain kiln before refilling it? And have you heard him say, "No, not this time—it was too hot—we will get it next time," or some similar excuse? Have you thought *and have you impressed the thought upon him* that waiting until "next time" would cost the plant several tons of coal?

Would it not have been better to have had him working on the principle that each kiln was due for a cleaning after every second, third, or fourth burn? Suppose his following that schedule had set back the setting one or even two days? Wouldn't the fact that the kiln would "burn in" closer to the other kilns, and that the resultant ware would be more like other burns in color, or hardness, or toughness, or whatever else you are after, be worth the two days' time?

The same principle of regularity should be applied to kiln repairs. *Every kiln should be inspected after every burn,* and the inspection should not be made with the spirit "I guess she'll stand up all right for at least one more turn," but with an eye to making repairs *just before they are vitally necessary.*

And a party to this inspection should be the head burner. He should be made sure and made to *say* that he is sure, that the kiln will stand up all right, and give a good burn, without being repaired. When he *has* said that, it will not be so easy for him to afterward blame a fallen fire-box, or a badly cracked crown for the poor results that follow these should-have-been-foreseen accidents.

It has been found a good plan, and one that may well be followed where a better plan does not suggest itself (and this is particularly applicable to the small plant), that the head burner be somewhat of a bricklayer. *When a kiln is out of commission on account of repairs being made to it, the burner has that much more time on his hands.* It looks reasonable to consider the employment of this spare time in the making of repairs that will enable the burner to produce better results with his burning.

Trade schools are conducted during the winter in many large cities, and bricklaying is taught in these in a way that two or three weeks should give a sufficient knowledge of the correct handling of trowel and mortar to make a man who understands the construction of a kiln, competent to make at least the simpler sort of kiln repairs.

Where a plant is of sufficient size, the keeping of a good mason on the pay-roll will be found a good investment. Some companies, which control three or more plants, have a "gang" that travels from plant to plant. The same principle could be applied by two or three independent manufacturers employing a mason and, if necessary, a helper, and so dividing their time that they would spend one week in three, or every other week, at each plant.

One great advantage in having your own mason is that he grows more and more expert as time goes on, in the kind of work that is to be done on a clayworking plant. For this reason, if none other, he is a better proposition than the journeyman bricklayer who can "lay any kind of brickwork," but no particular kind better than another. The local mason, too, depending upon residence construction work, is seldom willing to leave it in a busy season to make kiln repairs. Nor will he, as a rule, send his best man—the man you want for the kind of work you want done.

Should we proceed to the solution of "The Mystery of Number Seven Kiln" after the approved Sherlock Holmes method, we would first assure ourselves that it is at least as clean in its understructure as its sister kilns. If the fire "kicks out" at the furnaces, in spite of doors (as is generally the case with these "hoodoo" kilns) we may first deduce that the bag-walls are leaning toward the fire, and thus obstructing the gas passage from the furnace. Or we may find that the kiln has only a part interest in the stack that pulls it. Where partitioned stacks are used, it must be remembered that *no matter how well built,* these partitions will gradually lean and fall.

KILN INSPECTION REPORT **Kiln No.**..................

Date Cleaned	CONDITION OF							Remarks	Burner's Signature
	Bag Walls	Furnaces	Doors	Floor	Flues	Crown	Irons		

See, then, the necessity of stack inspection and repair. How many burns must be spoiled, before the culprit, in the form of a bent partition, is found hiding in the stack?

An inspection card for each kiln—a card that must be filled out by the burner after every burn—and then filed in the superintendent's office, would pay good dividends.

The simple and more common difficulties having been eliminated by this method, it may be that the "mystery" will still remain unsolved. Further investigation may bring to light the fact that the "hoodoo" kiln has a flue leading to the stack—but that the flue is not nearly as straight as the flues from the kilns that are of a better disposition.

In boiler practice, an allowance is made for bends in flues, and the loss of draft has been accurately determined by draft gauges. Why should similar conditions, existing in the underground work of a kiln, or in the flues that lead to stacks, or in the dampers, be ignored? Kiln dampers are infinitely more wasteful of heat than boiler dampers, yet the more exact processes that go to make up "good" boiler practice, take due notice of these draft losses, and for the sole purpose of saving heat energy.

The draft gauge should be given a chance to tell what "goes on" in the flues and at the stack, and the records of these "goings on" should be checked back against the records of the other kilns—the better behaved ones. It may be that "cantankerous" disposition is due to some little thing that can be straightened out in half an hour.

In the early stages of water-smoking, the draft at the damper of a kiln stack is barely measurable. Thus the kiln which has the straight stack flue and the better draft has much the advantage over a kiln with a long or crooked flue, and will not only finish water-smoking in a shorter time, but will "clear up" more quickly—incidentally, burning better ware with less fuel.

On many old yards, a new kiln has replaced an old one, or a new flue system has been built into an old kiln, but the old flue from the kiln to the stack is retained. Maybe it is the intention, at the time, to use that flue for a short time only and then to replace it. And in time, the intention is forgotten.

Then, inspection discovers a main flue big enough to almost admit of a man's walking upright, leading to a stack flue almost too small for a good sized man to crawl thru.

So a host of little things, each one comparatively small, may be the matter with your "mystery" kiln. Each one of these things may be the prime cause of the trouble in that kiln. *Depend upon it—there is a reason why one kiln acts differently from every other kiln on the yard* and there is no more sense in regarding that different way of acting as an incurable part of your trouble, than there is in believing that it is necessary to open oysters with prayer.

Depend upon it—there is some little thing the matter—something, probably, so insignificant as to have escaped your notice year in and year out. The trouble is, you have come to regard that "mystery" kiln as a sort of incorrigible—something that, being impossible to cure, must be endured.

If you will apply some sound sense to it—go at it with an idea that you are going to find it out if you have to tear down the kiln to do it—the chances are that the trouble will bob up serenely and ask you to do something for it, while the "mystery" kiln will soon be eating out of your hand.

DIES *for* HOLLOW WARE

Many Brick Manufacturers Are Considering Changing Over to Make Hollow Tile. Here Are a Few "Do's and Don'ts" That Will Prove Valuable

By A. F. Greaves-Walker

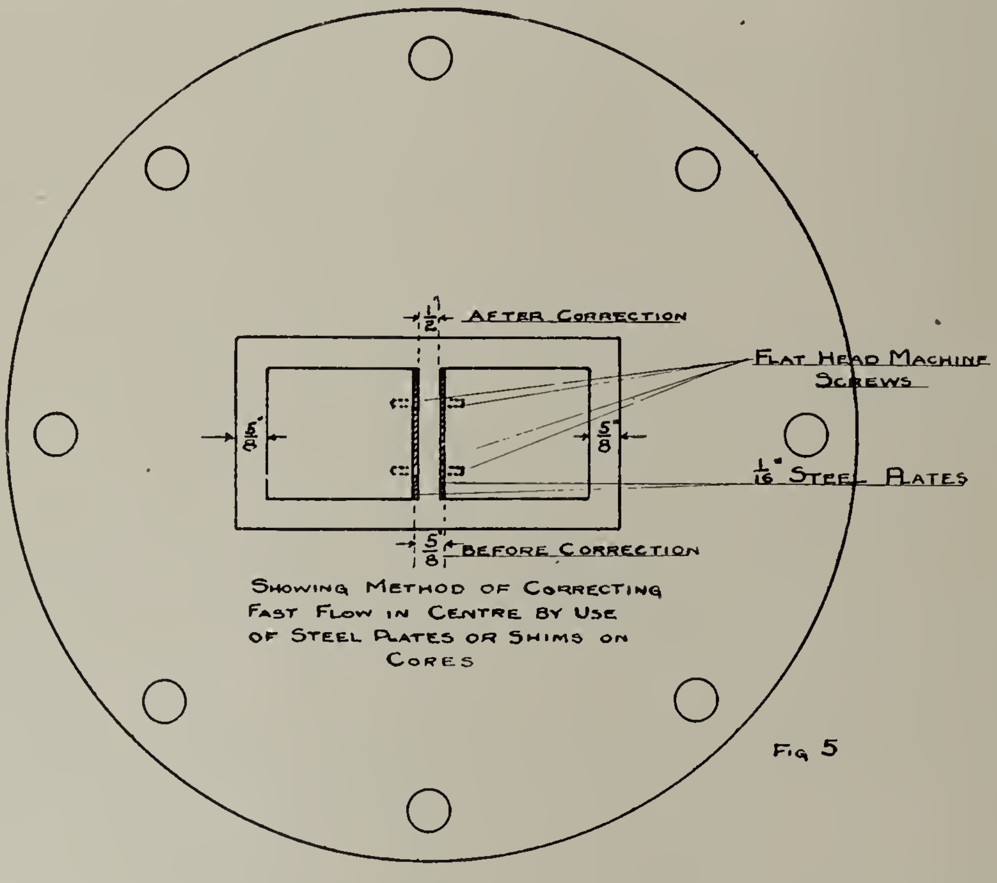
Author of "The Design and Construction of Down Draft Kilns," "Setting Down Draft Kilns" and "Running a Plant to Capacity"

(*Continued from the February 1 Issue*)

IT HAS BECOME an accepted fact that in order to secure the best results, the barrel of the machine must be proportionate to the size of ware made with it. This means that a well designed hollow-ware plant will have at least two machines—one for the smaller tile and one for the larger.

Competent authorities seem to agree that for such tile as 4-in. by 12-in., 3-in. by 12-in. and 5-in. by 8-in. column covering, Denison tile, etc., the barrel should be 16-in. to 17-in. in. diameter, while for the larger tile, the barrel should be only slightly larger than is required for the largest size.

The difficulty which arises when a large barreled machine is used for small tile is that the clay itself forms a tapering nozzle between auger and die, thereby creating the same conditions as are encountered in the use of a tapered nozzle machine. This is the excessive compression of the clay, and a reduction of the possible column speed.



Showing Method of Correcting Fast Flow in Centre by Use of Steel Plates or Shims on Cores

Fig 5

FORCE FEED

The tile manufacturer has gradually come to the realization that a force feed apparatus of some sort is an absolute necessity. There are a number of these on the market and most of them have merit. Of course, where a pug-mill is combined with the machine it acts as a force feed apparatus.

Some raw materials absolutely require a mechanical force feed to assist the auger to keep up the necessary pressure behind the die. In these cases even constant hand punching at the hopper will not prevent the uneven pressure from causing much loss at the drier.

There can be little question that in many cases where a man is kept constantly punching at the hopper in lieu of a mechanical feed, more or less mysterious die trouble occurs, due to constantly changing die pressure and flow. The cause may not be traced to this source, but it is reasonable to suppose that no matter how conscientious the "human force feed" may be (and it is often a boy who doesn't know what "conscientious" means) he will let up on his work at times. A car of ware comes thru the drier in pretty bad shape in the midst of others in perfect shape. There is much theorizing as to the cause and very often everything is blamed but the right thing—the "human force feed."

Even where a mechanical feed is used, care must be taken to make the pug-mill keep the hopper full or the same mysterious drier losses will occur.

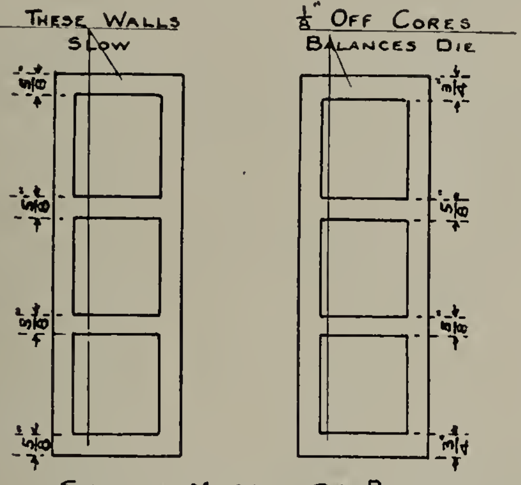
DISTRIBUTION OF METAL ON BACK OF DIES

In the foregoing the writer has attempted to treat in detail those factors outside of the dies which have an effect on die construction and adjustment. It will be readily seen that it is almost a hopeless proposition to successfully tackle the dies themselves unless some knowledge is possessed of the factors mentioned. And while a few clayworkers are so fortunate as to have raw materials which can be literally "murdered" and which make the tile business seem like child's play, it is not so with the vast majority. The great trouble with the tile business is that a clayworker starts out with one die, generally a simple one, which may give little trouble, but inside of a year or two he finds himself with anywhere from ten to fifty dies, and in the meantime he has found his difficulties increasing and his lack of knowledge of the "fine points" very disconcerting.

Coming to the dies themselves, it is found that the distribution of the metal at the back, in the shape of bridges, cores, bridge-posts, nuts, studs, etc., has an important bearing on the working of them. It will be readily understood that anything placed back of the die opening, if only a single thin bridge, will interfere with the equal flow of the clay thru the die opening and also the speed of that flow.

It should therefore be the object of the die builder to reduce this interference to a minimum by making the bridges, posts, cores, etc., as light as the service required of them will stand. It is also important that these metal parts be distributed over the back of the die as evenly as possible.

This will balance the "interference" and cause the clay to flow evenly. If this is not done and the bridges (for instance) are concentrated over any particular part of the die, the resulting interference with clay flow at that point will produce a slow area. This will probably have to be counterbalanced by baffles over the fast areas, the result being that the column speed will be considerably reduced.

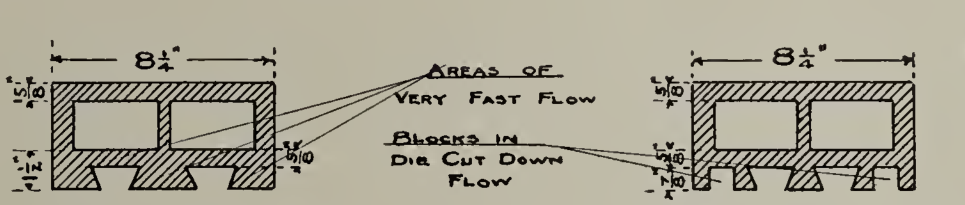


Showing Method Of Balancing Die By Opening Up Slow Walls Or Webs

Fig 6

A close study of his dies in action, together with a little experimenting, will soon teach a clayworker to easily overcome many die troubles by a slight shifting of the bridges and posts.

Two instances that have come to the writer's attention are cited; a partition-die allowed a fast flow in the center and was baffled at that point in order to balance it. The two outside bridges (it was a three core die) were moved 3/8-in. closer to the center. The cores were reset so that all webs and walls remained exactly as before. The result was a perfectly balanced die without the use of baffles, and which produced over 1,000 feet more ware per day.



Original Shape of Jamb Tile Die Decidedly Unbalanced

New Shape of Jamb Tile Die Perfectly Balanced

Fig. 7

In the other case the 7/8-in. nuts which held the bridges down on the bridge-posts were removed, and the bridges pinned to the posts instead. The removal of even this slight amount of metal (about one pound) increased the die speed almost ten per cent.

It will invariably be found best to avoid baffling a die with metal plates if such a thing be possible. Sometimes it is not possible and then they must be resorted to. Generally it entails more work to get a balanced die by other methods, but it always pays if tonnage and power consumption count for anything.

When a new die is put on the machine it must get a certain amount of wear before it gets "set." The bridges, cores and other parts must get a polish before anything definite can be told as to the final results it will give. In such cases it is wise to use baffles where necessary. It may be found that after a short time it will run well enough without the baffles, but if it does not, a move should be made to correct its faults.

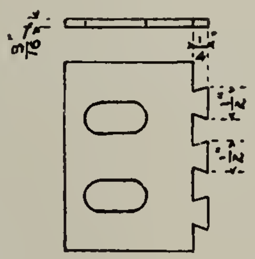
If, for instance, the middle cross-webs or web is very much faster than the balance of the die, a shim consisting of a thin piece of steel can be fastened to the cores, thus making the fast webs slightly thinner. Sometimes 1/32-in. will be enough (Figures 5 and 9). It in seldom that even 1/8-in. in web thickness will effect the sale or safety of a tile, so that this ordinarily cannot be an objection.

If, however, the webs cannot be made thinner (on account of reducing the safety factor) a thin cut on the sides of the cores next to the slow walls or webs, thus slightly increasing the thickness of these walls or webs, will have the same effect by speeding up the slow portions of the die, as is shown in Figure 6. When it is only a single wall or web that is slow, it is very easy and effective to open up the die at this point. This is very much better practice than baffling the entire die down to the speed of this slow portion.

Occasionally, a tile is of such a shape that one or more of its webs are very much thicker than all the others. Naturally such a die is very difficult to handle. A die of this type and a method of balancing it is shown in Figure 7. In the original, the wide wall was so much faster than the balance of the die that very large baffles were necessary. The resistance to the clay flow was so great that finally the die was broken. The second die works perfectly without the use of the baffles and is about five feet faster per minute.

SCORERS AND SCRATCHERS

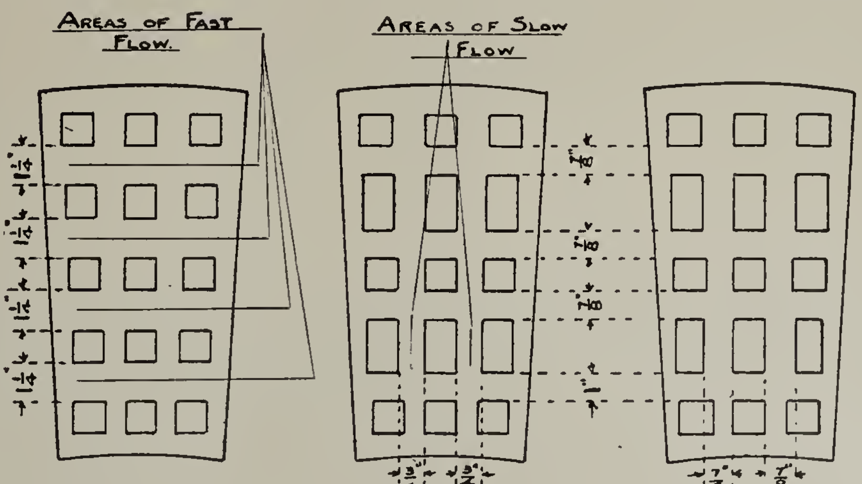
The type of scorer or scratcher used has a very considerable effect on the die. Some form of dovetail grooving is used on almost all modern plants, but the methods of producing it differ. Whatever the design of the scorers, their shape has a tendency to drag at the walls of the tile, invariably slowing them.



Tool Steel Scorer Adjustable

Fig 8

As the grooving is absolutely necessary, the speed of the whole die must be made to conform to the grooved walls. However, the number of grooves make a very considerable difference and this may often be taken advantage of in adjusting a die. If a die has a slow wall on which are six grooves, a reduction to five or four may be all that is necessary to correct the trouble. Similarly a fast wall may be slowed down by the addition of one or more grooves or by the widening of them. When flat steel scorers are fastened on the outside of the die they can be moved in or out to make more



Original Tile

First Attempt at Balancing

Second Attempt at Balancing Die Perfectly Balanced

Fig 9

or less resistance. (See Figure 8.) These are simple expedients and should be taken advantage of at every opportunity.

METAL BAFFLES

When it is impossible to take advantage of any other method, the metal plate must be resorted to to prevent local fast areas in a die. The plate is fastened to the die plate or bridge according to the location of the trouble. This method of adjustment is very simple but its use leads to increased power consumption, often a slow running column, smashed bridges and sometimes smashed dies.

There are times when a metal baffle is absolutely necessary. A die may be so constructed that a thin core will be so exposed to the clay pressure that it shifts, thereby unbalancing the die. In such cases a small baffle is placed on top of the bridge in such a position that some of the pressure is taken off the exposed side of the core, allowing it to retain its normal position. Care should be taken to make a baffle as small as possible and still get desired results, and never to use a baffle until every other means has been exhausted.

BRIDGE CRACKS

Bridge cracks are the hollow-ware maker's bugbear. There is unquestionably more trouble from this source than any other yet (strange as the statement may seem) it is often the easiest to overcome.

When the clay is parted by the bridge it must be given a certain distance and a certain amount of pressure in which to "weld" again. Some materials are of such a physical nature that they will do this in one inch of travel while others require from three to six inches. In preventing bridge cracks the tapered die is supposed to have a decided advantage over the flat die, in that the clay is given a slight compression after passing the bridge. However, close observation of the two have failed to give either an advantage in this respect.

When a bridge crack occurs, one thing is shown plainly and that is that *the clay had not sufficient opportunity to knit* from the time it passed the bridge until it issued from the die, or putting it another way—the bridge was *too close to the point of issue.* Probably setting the bridge back a ½-in. would overcome the difficulty entirely or it might be necessary to move it three or four inches.

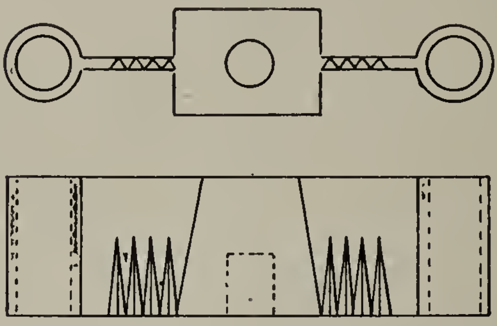
Materials vary so much in their knitting or "welding" qualities that only by experiment can the proper distance be determined. If a die turns out bridge cracked ware *the bridges should be moved back a little at a time* until the trouble ceases, and cease it surely will when the proper distance is found. As a general rule, when once the proper distance is determined, all bridges can safely be placed at that distance, but occasionally some one die will require a separate treatment.

Various means are used to assist the clay in knitting. One of these is to serrate or "saw-tooth" the bottom of the bridges (See Figure 10.) Another is to wrap a chain around the troublesome bridge. However, where it is necessary to resort to the latter device it is best to move the bridge back slightly, as the chain has to be constantly replaced. The temper of the clay may have a bearing on bridge cracking. Some material will knit readily when given a certain temper and refuse to knit when the clay is not so treated.

DIE WEAR

The openings in a die are subject to the constant abrasive action of the material forced thru them. Some materials being more gritty than others wear dies faster, but all dies wear out sooner or later. Just when a die *is* worn out and ready for the scrap-heap or the machine shop is a matter that is difficult to decide. Dies of the ordinary cast-iron variety, when built for speed, begin to slow up and act badly very quickly. With progressive manufacturers this "slowing up" means that the die is ready for the discard. Other manufacturers continue to use a die until it almost refuses to run a column. It will readily be seen that this is a short sighted policy, for not only does the loss of from two to ten (or more) feet per minute amount to a considerable tonnage in even a day's run, but the increased thickness of the walls and webs adds considerably to the cost of manufacture and to the freight when the ware is shipped.

As has been previously mentioned, when the angle of the die opening passes a certain point, the column begins to slow down, and it becomes increasingly slower as the angle becomes greater. Furthermore, the wear on the die plate and the cores so affects the flow that it becomes increasingly harder to keep the die balanced.



Serrated Bridge
To Prevent Bridge
Cracks
Fig 10

As a well built die costs from $25 to $50 a tile maker has only to sit down and figure *an equal loss in tonnage and cost to find out when his dies are worn out,* no matter what the appearances may be.

Brickyard scrap piles are often fearful and wonderful sights, but most fearful and wonderful of all are the scrap heaps of some hollow-ware plants, especially some of the larger ones. It is undoubtedly good practice to withdraw from use a worn die, and *it is unquestionably bad practice to use a die which should be thrown away.*

Quite a number of manufacturers have developed dies which, with minor repairs, practically last forever. In such dies the cores are lined with replacable tempered tool-steel plates. All wearing surfaces except the bridges are lined with the same material. Others line the dies and cores in the same way with mild steel or cast-iron. The writer has never seen a type of dry die which could not be lined and relined in this way, altho the original lining might be difficult in some cases. However, if it is too difficult a proposition there can be no reason why the type should not be so modified as to permit of its being done and thus cut out a source of loss. At any rate, there can be no reason why ordinary cast-iron should be used at all. Far better wearing materials, and which can be as easily machined, are available at up-to-date foundries and case-hardening of most of the wearing parts is not a difficult matter. Unfortunately, to follow such suggestions increases the first cost of a die (possibly one-third) and this is almost always an objection to the clayworker, even tho such expenditures pay dividends in the long run.

Objection is heard in some quarters to the use of certain materials in die construction, for instance, tool-steel, it being often claimed that this material slows a die. After numerous experiments, the writer cannot believe that this objection is valid, no matter what the qualities of the raw material may be. For such claims are generally based on theories or experiments which have never been followed thru, or are advanced by men who are afraid to step off the beaten paths they have trodden all their lives.

Another Greaves-Walker Article
Will Appear in a Near Issue. It Will Have
for Its Subject the Design and Construction of
Continuous Kilns

CENTRAL STATION POWER
applied to
SOUTHERN CLAY PLANTS

The Following Article is Reproduced by
Permission from the "Electrical Review"
and Gives Some Very Interesting Cost Data

Clay Pit and Storage Shed in Typical Dry-Press Brick Plant in the Southwest

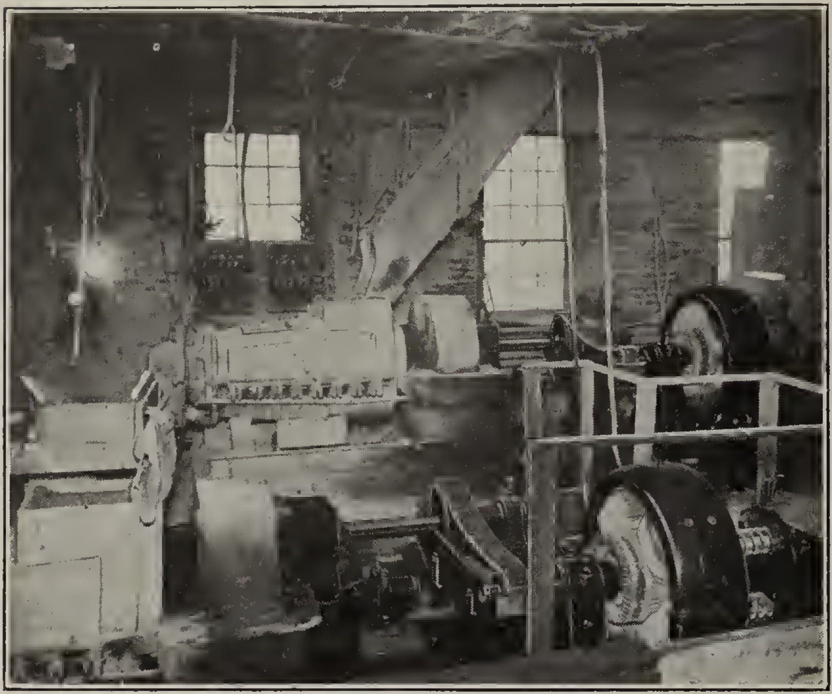
IN THE SOUTHWEST, where dry-press brick is still made in greater amounts, possibly, than stiff-mud, very little development or improvement in manufacturing processes has taken place. Applications of new methods of manufacture have been difficult to start and the natural tendency to stick to old ways has been a hindrance to the adoption of electric drive.

Red, dry-pressed brick are made from a clay or shale which appears in various parts of the country in considerable quantities. This shale is found a few feet below the surface of the ground. The first factor to be considered in the location of a brick plant is the depth of the shale strata, as all the top dirt must be removed before suitable raw product is procured.

The clay pit, as it is called in the ordinary brick plant, covers an acre or more of ground and is sometimes as much as 50 feet deep. The top dirt having been removed, the pit is gradually formed, the clay being used gradually for making brick. Care is taken to work the surface evenly as drainage is thus facilitated and bad weather is less likely to interfere with the operation of the plant if the pit is properly drained. Usually the pit is worked

Scove Kilns Water-smoked with Wood and Burned with Oil. Time from Clay Pit to Finished Product, Thirty Days from one side to another so that at all times one side will be lower than the other or else it is worked so that a certain point is always lowest. The latter is the more usual method and when this system is used an ordinary steam or centrifugal pump is placed near this point and the water is pumped out as fast as the rains fill it up. In this way clay can be taken from the pit within a very few days after the most soaking rain.

Usually the hard shale is plowed and allowed to stand a few days before being carried into a storage shed. This serves to pulverize or slake it and it is much more easily ground. In the Southwest the storage shed is built to hold a large enough supply for one month's use. Here the clay is evenly distributed and left to be further dried.


A Silent Chain Drive

From the storage shed the clay is fed into what is known as a dry-pan. This dry-pan has a bottom made of heavy iron screens with rectangular openings. Two large, massive rollers which move in a direction opposite that in which the dry-pan rotates crush the clay or shale thru the openings in the bottom into a square pit, where it is carried by means of bucket elevators up and over a series of screens in the loft above. The fine material is separated here and fed into a cylindrical mixer which mixes the large and fine particles together, assuring an even texture in the finished brick. The powdered mass is then fed thru a large rubber hose into the press-boxes where, as the press-wheel revolves, it is subjected to a presser of more than a ton to the square inch. As the brick come from the press they are placed on a long carrier and conveyed into the kiln where they are set ready for burning. Before being burned the brick are thoroly dried out by means of slow wood fires, this process taking from 10 to 14 days, depending on the nature of the weather. When the drying process has been completed, oil fires are started in arches on each side of the kiln and the fire gradually raised until the brick have reached a temperature of about 1,700 degrees Fahrenheit. The fires are then cut out and the openings sealed up and the brick allowed to cool gradually. In about a week or ten days a part of one end of the kiln is removed and the brick are loaded onto cars. It takes a little more than a month from the time the clay is removed from the pit until it is placed in cars for shipment.

THREE STAGES IN MANUFACTURE

There are three distinct stages in the manufacture of dry-pressed brick and these three stages can be still further subdivided. The three divisions are made, however, because they are practically independent of each other as far as application of electric power is concerned and any one of the stages can be operated with the balance of the plant idle.

(1) Removing clay from pit and putting it in storage.

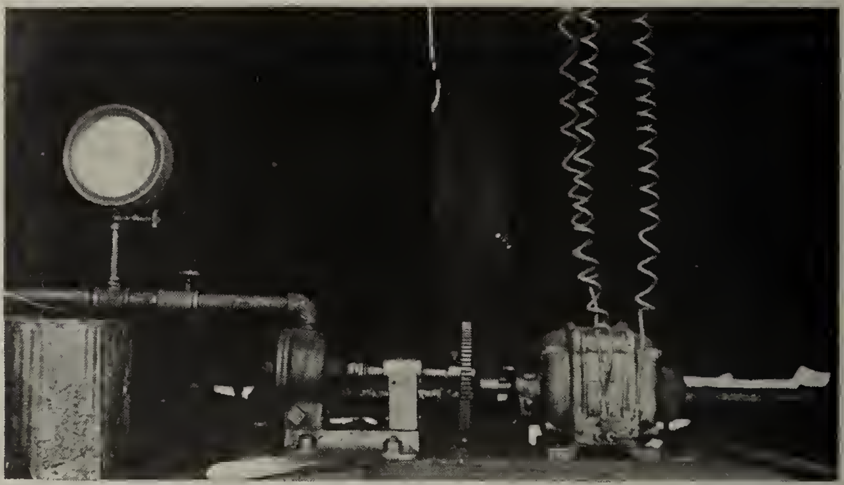
(2) Taking clay from storage and putting it thru machinery which transforms it into brick, the brick being placed in the kiln.

(3) Burning process or time occupied in converting green brick into the finished product.

There are at present three general methods of conducting the first process, one method of conducting the second process, and three methods of conducting the last-named stage.

In the territory served by the Texas Power & Light Company one plant plows the shale-pit and removes the clay by means of mule-team and scraper directly into the storage shed. Other plants use the plow and remove the clay in scrapers to a central point in the pit where it is dumped into a car which hauls it into the shed. Two plants are using a mechanical scraper to dig up the clay, one of these dragging it to a central part of the pit and hauling it into the storage shed in a car and the other taking the clay directly into the shed by means of the scraper. While the latter method is probably a little cheaper as far as labor is concerned, there is no doubt that the cost of maintenance and repairs on the equipment used in conveying the clay directly into the shed eats a large hole in the saving thus effected.

It is easy matter to adapt electric drive to either of the latter two methods. At one plant the mechanical scraper is now being driven by a 50-horsepower, variable-speed, three-phase, induction motor which is connected to the hoist drums by means of a silent chain. This is effective, quick and efficient. No trouble has been experienced with this installation. From the central-station standpoint, however, the load is irregular and not steady. On a moderately large system, however, this variation would prove negligible. A separate motor is used to drive the drum which operates the clay car. A 10, 15 or 20-horsepower squirrel-cage motor, the size depending on the incline and the speed desired, makes an admirable drive for this part of the equipment. Here is one place where electric drive is very advantageous, since it is often desired to operate this part of the plant without operating the main machinery and unless electric drive is used it is necessary to operate the boiler plant at a greatly reduced load in order to provide steam for the small engine with which these cars are usually operated in steam-driven plants. Then too, in cold weather, since this small engine is of necessity a considerable dis-


One Horsepower Motor Geared to Oil Pump which Furnishes the Oil for Burning the Kilns

tance from the main plant, a large amount of the steam condenses in the pipe-line, causing further loss.

MOTOR DRIVE FOR BRICK MACHINERY

Practically all of the plants are using the same method for the second stage of the process. A mule-team with light scraper is used to feed each dry-pan. It takes from one to two minutes for the driver to make a trip and hence the pans are alternately crowded and empty. This causes an uneven load and consequently loss in production and efficiency. Various attempts have been made to interest these manufacturers in conveying machinery for this part of the plant but with no success as yet. With the proper conveying equipment one man could do the work that now requires two men and two teams. This would effect a considerable saving, even after allowance had been made for power for the conveyors and interest and depreciation of equipment. Then, too, a more uniform load could be obtained, and consequently, greater efficiency.

Standard squirrel-cage motors are readily adaptable to the driving of crushing and pressing machinery. Most of the plants are two-press plants, each having a capacity of 20,000 brick per day. It is very seldom that these are operated separately, altho there are occasional shutdowns of one side of the plant. For this reason and on account of the variation of load due to weather conditions, one motor will prove more efficient than two in this part of the plant. A 100-horsepower motor will furnish ample power for two presses, two dry-pans and the necessary elevators. This machinery runs at constant speed and the load is fairly constant thruout the entire day. The load will vary somewhat during the different seasons of the year due to moisture in the clay. This makes a noticeable difference in the power consumption and in the amount of fuel required to burn the brick.

Plant A

Plant "A" has a capacity of 40,000 dry-pressed brick per day of approximately ten hours.

Operating hours per month, 260.

Total number of motors installed, 4.

Total horsepower, 124.

Average production per month when running full time, 1,000,000 brick.

Average kilowatt-hours per thousand brick for running machinery, pumping water and oil, and supplying air for burning, 20.

Load factor, 20%.*

Consumption by Months

	K.w.-hrs.		K.w.-hrs.
January		July	14,565
February	13,000	August	14,100
March	14,100	September	8,600
April	17,600	October	
May	10,900	November	
June	11,200	December	20,000

Motor Installation

Following is a list of motors installed, with the machines driven: One 100 H. P., 900 R. P. M. motor, belted to line shaft and driving two brick presses, two dry-pans, two strings bucket elevators and two mixers. One 20 H. P., 3,600 R. P. M. motor, direct connected to centrifugal blower, capacity 1,650 cu. ft. of free air compressed per minute to two pounds pressure. One 3 H. P., 1,800 R. P. M. motor, direct connected to centrifugal pump for pumping water from pit. One 1 H. P., 1,200 R. P. M. motor, geared to rotary oil pump.

It is necessary to heat the press-boxes and dies in order to keep the clay from sticking and this small item has proven of considerable importance in the application of electricity to this business. Several electric heating units were tried out at one plant but the moisture in the clay is so great and the exposed surface of the die plates and press boxes so small that a heating unit could not be obtained which would do the work at a low enough cost. For this reason a small upright boiler was obtained, which has been successfully used and requires practically no attention, since oil is used as fuel.

Plant B

Plant "B" has a capacity of 40,000 dry pressed brick per day of approximately 10 hours. Number of men employed, 16.

Operating hours per month, 260.

Total number of motors installed, 4.

Total horsepower, 170.

Average production per month when running full time, 1,000,000 brick.

Average kilowatt-hours per thousand brick for running all machinery and operating clay hoist and drag, 18.

Load-factor, 15%.

Consumption by Months

	K.w.-hrs.		K.w.-hrs.
January		July	14,820
February		August	8,090
March	13,909	September	
April	15,640	October	
May	11,310	November	
June	18,960	December	

Motor Installation

Following is a list of motors installed with the machines driven: Two 50 H. P., 900 R. P. M. motors, each belted to line shaft driving one four-mold brick press, one dry-pan and one string of bucket elevators. One 50 H. P., 720 R. P. M. motor, driving by means of silent chain, hoisting machine which is connected with a scraper for digging clay from the pit. One 1,200 R. P. M. motor belted to drum hoist which operates clay car in storage shed.

The brick are taken from the presses by the pressman who loads up a two-wheeled carrier. This carrier is wheeled into the kiln by hand. Here is a place where conveyors might again be used, but as labor is comparatively cheap it is doubtful whether any saving would be effected by using mechanical conveyors. The physical nature of the plant would necessarily require a large amount of equipment which would have to be moved from kiln to kiln. This matter has never been pushed.

BRICK BURNING

We next come to the burning process which has so far proved a big stumbling block in getting this business. The manufacturers keep all their records of fuel cost together and few of them have any data as to what portion of the fuel bill should be charged to their machinery and what part to their burning. The same boiler is used to furnish steam to the engine and to furnish steam for atomizing the oil used in burning. Hence the owners maintain that there is no saving on equipment and also maintain that there is a loss (provided they use their same equipment) due to running their boiler at a reduced load. This is true in part but nevertheless there is a certain part of the expense chargeable to the power plant proper and an analysis of this phase of the problem shows that electric drive can be employed in the operation of the machinery and steam used in the burning process with a considerable saving.

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*The term load factor is used in such a sense that a load factor of 100 per cent represents the use for twenty-four hours every day of power corresponding to the rated capacity of the motors connected. An operating-time load factor of 100 per cent represents the use of the rated capacity of the motors for the running hours per day specified for each installation.

Nevertheless, in order to follow the line of least resistance in obtaining this business, investigations were made of other methods of burning. Natural gas is now being used in some of the plants and where this is being done this question has been eliminated. The only other method found was an old one and experiments were at once started. An air compressor was obtained and experiments made to determine the probable size of machine necessary for a plant of this size. The experiments started with a pressure of 100 pounds of air to the square inch, but it was quickly decided that this was not feasible, as too large a capacity was required to make the matter commercially successful. After experimenting with various pressures it was decided that volume rather than pressure was what was needed. Accordingly tests were made with a number of patented low-pressure oil burners and one was finally chosen which it was thought would do the work.

A large motor-driven blower furnishing air at two pounds pressure was secured. A 10-inch galvanized header was run from this blower along the end of the six kilns and tees were placed at each kiln, six-inch openings being made. From these tees a lateral six-inch spiral rivetted pipe was run along the entire length of the kiln. There are 21 eyes on each side of these kilns and it was necessary to provide taps on the six-inch pipe for 21 one-inch pipes. Air was fed to the burners thru these one-inch pipes and it was found that plenty of air could be obtained with this arrangement with no noticeable loss in pressure. A one-inch oil line was used as a main lateral and quarter-inch feeders were connected to this.

The oil was heated indirectly by means of a single burner, a brick vault being made with baffles that caused the hot gases to pass around a coil of the oil pipe. This vault was placed at one end of the yard. This method of heating was not a success as the oil cooled off in cold weather before it reached the burners. Several other methods of heating the oil were tried. Pipes were placed above the kiln and the oil fed thru these. It was thought that the hot gases would sufficiently heat the oil. The heat was so great, however, that the oil was in some cases converted into a gas and this caused fluctuations on the burners. The results obtained on the first kiln burned were as follows:

Number of brick in kiln	390,000
Net amount of oil used, barrels	350
Kilowatt-hours used	1,360
Duration of test, hours	105
Average load in kilowatts	13
Kilowatt-hours per thousand brick	3.23
Net barrels of oil per thousand brick	0.90

These results were considered very favorable for the first test, but the objections above mentioned together with a certain amount of opposition on the part of the labor element employed postponed the acceptance of the method. There is little doubt, however, but that with the proper type of labor and the perfection of several mechanical details this method can be successfully applied to this business.

DESIRABLE CLASS OF BUSINESS

The brick plant has a very good load-factor and is desirable business for central-station power. Brick plants operate continuously during the year and for that reason can make a very good showing on operating costs with steam. During the past eighteen months, due to inactivity in the building industry, most of the brick plants in Texas have been forced to shut down for periods of from one to three months, and some of them have been shut down as many as six months during the year. For this reason they are not inclined to spend new capital in improvements even tho by so doing they can decrease their operating costs.

Labor is employed on a basis of so many brick produced per day and hence electric drive has no advantage as far as production is concerned. It is strictly a matter of economy with the manufacturers in connection with the installation of electrical machinery. The engineer can be eliminated when electric drive is substituted for steam and saving can be made in lubricating oil, waste, repairs and other minor items. Boiler insurance must be continued, however, if steam is utilized for the burning process. Most of the plants have their own artesian wells and consequently their water cost is negligible.

Convenience of operation, flexibility of drive, facilities for keeping daily costs of production in the different parts of the plant, and elimination of power-plant troubles are factors which assist in obtaining contracts for this class of business.

MEDIEVAL ART TILE REPRODUCED *in* AMERICA

Various designs in decorative tile were shown in a recent exhibit at the Newark (N. J.) Public Library which attracted considerable attention from visitors. The tile was made by the Moravian Pottery and Tile Works of Doylestown, Pa., many of them being careful reproductions of designs created during the Middle Ages in Germany, England and different parts of Europe. Not a few of the designs were adapted from the old iron stove plates and earthenware of colonial Pennsylvania.

The manufacture and use of decorative tile dates from very ancient times. From Egypt and Persia, it spread westward and northward thru Europe to England where the abundant fancy of fourteenth and fifteenth century artisans produced the wonderful tiled pavements and wall decorations, many fine examples of which have been found at Salisbury, Winchester and the chapter house of Westminster Abbey in England, and other monastic centers.

Tilemaking in America is largely a development of processes brought over by German colonists. The first tile made in this country were probably roof tile. Inlaid floor tile was made at Bennington, Vt., in 1853, but it was more than twenty years after that domestic art tile was extensively made.

SHORT COURSE *in* CERAMICS

In Which the Recent "Short Course" at Illinois University is Described by One of Those Who Attended its Sessions

By Leo J. Sheridan

TWENTY-THREE MEN, the majority of whom are actively engaged in work connected with clay-working plants, attended the "short course" in ceramics at Urbana, Illinois, the second week in January. Letters received from a number of these men testify to the practical value of the course and of its application to everyday plant problems.

Some of the best authorities in clayworking—men of national prominence—were in charge of the course. A. V. Bleininger, B. Sc., Bureau of Standards at Pittsburgh; Ray T. Stull, E. M. (in Cer.), formerly director of the ceramics department of the University of Illinois; Homer F. Staley, A. B., Professor of Ceramic Engineering at Iowa State College, and Carl B. Harrop, E. M., Assistant Professor in Ceramic Engineering, Ohio State University, were among these. Associated with and assisting them, were instructors drawn from the faculty of Illinois University and other educational institutions.

Despite the prominence of the instructors and the comprehensive nature of the course and the success of previous "short courses" at Urbana, the number of students was disappointing. It is rumored that unless greater interest is shown next year and that an attendance which will be at least double that of 1916 is assured, the "short course" will either be dropped or a decision then reached that it be given every other year instead of annually.

The University of Illinois not only possesses the finest quarters for its classes in ceramics—finer than those of any university in America and, it is said, in the world—but it rivals all other universities, in this country at least, in that it offers free tuition not only to the residents of Illinois, but to residents of other states. In the case of the "short course," which, as has been said, is given free, only eight out of the twenty-three students who registered were from Illinois, the balance being from various other points in the country, including points as far distant as Oregon, Texas and New York.

Expenses were very small, railroad fare and board constituting the largest items. Incidentally, the board is very cheap in both Urbana and Champaign, the cities between which the University of Illinois is situated.

Eleven days—full eight-hour days—and two evenings were given to the "short course." The time was so limited and the subject so large that very fast, concentrated work was necessitated. The program of possible subjects was cut to the very bone of practicability and for the most part, the subjects taught were presented with a view to making the students understand the principles of driers and the means of regulating them; the construction of kilns, stacks, flues and fire-boxes and the properties of coal; the action of gases in determining the color and character of the finished ware and a host of other valuable information, every bit of which could be applied to practical work that is to be found on any clay plant.

But to crowd all of this work in so short a period of time called for the most perfect management and an exceptionally fine adjustment of minutes to subjects; and with few exceptions, those who had the benefit of working under the excellent schedule, noticed how smoothly the "wheels" ran. Few delays were experienced—little time wasted—when the work of one instructor was over and his notebook closed, the next instructor stood ready to pick up the thread of the schedule and with the shuttle of his expert knowledge, weave his part of the fabric of the "short course."

While emphasis has been placed upon the fact that the "short course" was of great practical value to the clay-workers, due mention must be made of the work that was done in the laboratories and which would under ordinary conditions be classed as "theoretical." Every minute spent in this way was devoted to a definite object; many of the clays that were tested had been sent from the plants where the students were employed and, as a consequence, these men had an opportunity, each for the first time in his life, of making a laboratory test of his own clay. The simplicity of this process appealed and it is easy to believe that from now on, these men will test their clays at home. Considerable stress was laid upon the use of "curves" and the proper diagraming of the results of tests and other experiments.

In the lectures, clear and concise information on clay-working problems was given and here the "theoretical" construction was so mingled with practical advice and so simplified that anyone possessing a common school education (in addition to some plant experience) could easily comprehend it.

While it is unfair to the rest of an altogether excellent course to pick out any one feature and say that it was "best," if that were done, the chances are that the sessions devoted to question-asking and discussion of plant problems, would be given the palm. Altho the program called for only one period under this title, every lecture developed into a question-asking meeting, and when it is considered that these clayworkers were in direct personal contact with some of the best developed minds in the ceramic field—able to ask the question and receive the counter question—give the explanation and then receive the solution of their problems at first hand, it is readily understood why so many of these men have written telling how much good the "short course" did them and how highly they value it.

Like all other clayworkers, these students had their own troubles, and this opportunity of unloading those problems upon men like Bleininger, Stull, Staley and Harrop was too good to be missed. Frequently, after the regular study hours, groups of two or three would be found around one of the professors, still "firing" questions at him and in nearly every instance receiving advice that could well be called priceless.

Possibly one of the reasons for this was the fact that all of the instructors had expressed their desire for the injection of what they called "specific instances" and figured that an answer which might solve a problem on one plant would perhaps solve the same problem upon many. So they looked for actual troubles and certainly got them.

One of the students leaving Urbana for his home, stated that at the end of one day's attendance, he had received enough information from a single lecture and discussion on driers to be able to go back to his plant and overcome a trouble which had been causing a great deal of loss and expense for more than a year.

One hour of each day for a whole week was devoted to ceramic chemistry. While it seems hardly credible that even a superficial knowledge of the subject could be given and received in that short time, it is a fact that men previously unread on this subject were discussing the properties of clay in chemical terms and making tests for lime, iron, magnesium and other impurities like "old timers" before the end of a week. As one student said, they were "shaking hands" with the chemical formulae that had been strangers but a week before.

There is no doubt but that the chemical instruction achieved at least one purpose—to acquaint the clayworker with what has been called the "short-hand" of chemistry. These seemingly difficult signs and symbols have been and always will be a part of every technical article upon clays and clayworking. To many clayworkers their presence in clayworking literature is forbidding. The "short course" is helping that and by introducing technical terms and chemical formulae has started to promote a friendship which will be very much to the benefit of claycraft.

The work of the "short course" followed, so far as was possible, the progress of the clay from the moment it is "won" from the pit, mine or bank, until it is a finished product. Methods of quarrying, haulage, grinding, pugging, washing, filter-pressing and other incidents of preparation were discussed; the shaping of the product brought discussions of auger-machines, the construction and design of dies, the various methods employed in the dry-press, stiff-mud and soft-mud processes of brickmaking, jiggering, hand-pressing, and casting. This subject, which was assigned to Professor Stull, afforded an opportunity of an exhaustive essay on lamination—a point upon which the instructor is particularly well fitted to speak. Professor Bleininger took up the discourse when drying was reached, and covered practically every type of drier used in clayworking, making suggestions as to the proper control of each—its defects and advantages.

Arthur E. Williams, of the University of Illinois, together with Professor Bleininger, took up the subject of burning, and all thru this part of the studies, much weight was laid on the advisability of keeping accurate records—cone, settle and pyrometer—so that burning would become much more of an exact science than it is at the present time on many yards. Kiln construction was also treated, and later, in the laboratory, the effects of oxidation and reduction were noted. Barney S. Radcliffe, A. B., of Illinois University, and Professor Harrop of Ohio University, were active in this branch of the course.

Shoveling coal was made a part of the work of the course, two kilns being burned off, the students acting as day and night firemen. In this was emphasized the necessity of the draft gauge and pyrometer, as well as of gas analysis. And again, the matter of plotting curves was brought up—this time in recording temperatures.

Practical lessons on the care and maintenance of machinery, on the use of, and selection of power-transmission, ways and machinery for handling crude and finished materials, and on power producing equipment, both steam and electrical, were received with intense interest.

The names of the students who attended the course follows: T. S. Mann, Pacific Stoneware Company, Portland, Ore.; Fred A. Morgan, Picher Lead Company, Chicago; R. P. Morrow, W. H. Hill and L. C. Wilson, Harbison-Walker Refractories Company; V. B. Stockdale, Abingdon Stoneware Company, Abdingon, Ill.; C. E. Carter, Carter Brick Company, Peoria, Ill.; A. E. Johnson, Mediapolis Brick and Tile Company, Mediapolis, Iowa; G. W. Rathjens, Twin City Brick Company, St. Paul, Minn.; V. W. Krick, Decatur, Ind.; J. A. Gregg, Broughton Brick and Tile Company, Broughton, Ill.; B. R. Duffy, National Roofing Tile Company, Lima, Ohio; G. C. Huffman, Mexia Pressed Brick Company, Mexia, Texas; B. F. King, Colchester Brick and Tile Company, Colchester, Ill.; Edgar Angle, Hocking Valley Brick Company, Logan, Ohio; W. O. Rathfon, Mecca, Ind.; W. P. Brannon, Dickinson Pressed and Fire Brick Company, Dickinson, N. D.; G. C. Landgrebe, Huntingburg Dry Pressed Brick Company, Huntingburg, Ind.; L. M. Munshaw, American Terra Cotta Company, Terra Cotta, Ill.; E. F. Bridges, Oskaloosa Vitrified Brick Company, Oskaloosa, Ia.; Amra Hostetler, Sugar Creek Clay Products Company, Sugar Creek, Ohio; C. F. Mattes, Decatur Brick Manufacturing Company, Decatur, Ill.; Leo J. Sheridan, "Brick and Clay Record," Chicago.

Letters that have been received from those who took the course, and who have returned to their several plants and offices, give the strongest kind of an endorsement to the "short course." A few extracts follow:

"Relative to the short course at Urbana, wish to say that I consider it has been well worth the time and money required. Since coming home, I have had one or two cases where information obtained during the course has been of benefit to me. I do not know just where this short course could be

The Nineteen Sixteen Class at Illinois University's Short Course in Ceramics improved upon, nor could I say just what the men missed who did not attend the course, as it would all depend upon the amount of knowledge they already possessed. You can put me down as being strong for the course and the treatment that was accorded us during our stay."—*Robert P. Morrow, Harbison-Walker Refractories Company, Cleveland.*

"It seems to me that inasmuch as the course is very short and the work necessarily must be concentrated in the two weeks, it would be a very good idea for the men in charge to specialize each year in one particular field; in this way I believe the work could be made of more practical value and would give the men a greater amount of work in their field and eliminate much that they are not vitally interested in."—*Fred. A. Morgan, Picher Lead Company, Chicago.*

"I was much pleased with the course and think it was well worth the cost, and if it is possible to have a short course in 1917 I will be there. Our plants are closed down for repairs and so I have not had time to apply any of the knowledge that I received, but I am sure that when we start to operate again, the knowledge I gained will be of much service to me."—*C. E. Carter, Carter Brick Company, Peoria, Ill.*

"I have been in the brick manufacturing game for seventeen years, beginning as water boy and working up until I have had the superintendency of several of the best yards in the state. When I learned of this opportunity at Urbana I made arrangements to get away from the plant, and while I had lots of practical experience, most of it has been fought for. The knowledge received at the short course puts me in a position to act without further experimenting. I found that during this course the professors and students went to the root of plant troubles and they were brought out in such a way as to impress them upon the minds of those who attended. I believe that going to these short courses is much better than reading about them. In my present work I have a new yard and new clay and have shouldered the responsibilities of both. While I was fairly successful before taking this trip to Urbana, I feel that I have learned in the few days at this short course, what it would have taken me many months to have found out had I stayed at home."—*G. C. Huffman, Mexia Press Brick Company, Mexia, Texas.*

"The short course in ceramics given at the University of Illinois is in my opinion of great value to all interested in the manufacture of clay wares and it is a mistaken idea to think of it as being theoretical, because it is very practical. I do not see where the course could be improved by any change."—*Edgar Angle, Hocking Valley Brick Company, Logan, Ohio.*

"I feel that the time and money it cost me was very well spent and that the information gained will be worth considerable both to me personally and to my company."—*E. F. Bridges, Oskaloosa Vitrified Brick Company, Oskaloosa, Iowa.*

"The writer received so much good from the time invested that he wishes it could have been possible to have been there the entire week. This much is certain—if the course is held next year, our company will be well represented."—*C. F. Mattes, Decatur Brick Manufacturing Company, Decatur, Ill.*

"It was indeed the finest education in practical problems for all clayworkers; the time and money spent was surely repaid by the theories, facts and ideas obtained. I also figure it out to be a very good investment for the points gained at this course would cost anyone more time and money to obtain in other ways."—*Gilbert C. Landgrebe, Huntingburg Dry Pressed Brick Company, Huntingburg, Ind.*

"It would be impossible for any intelligent man to attend the short course and not come away with more accurate information in his line of work and a clearer vision to enable him to successfully apply the energy and invest the money he expects will be used in his work. The instruction gives a man a clearer knowledge of the formation of clay deposits and so he is better able to take the clay as he finds it and knowing what has been done in nature's laboratories he is less liable to make mistakes."—*W. P. Brannon, Dickinson Fire and Pressed Brick Company, Dickinson, No. Dak.*

"In my opinion the short course in ceramics as recently held at the University of Illinois could scarcely have been improved upon in any particular and it was a source of considerable surprise to me that this course was not more largely attended by the manufacturers of clay products."—*W. H. Hill, Harbison-Walker Refractories Company, Chicago, Ill.*

ILLINOIS CLAYWORKERS STAGE MIRACLE PLAY

THE ILLINOIS CLAY Manufacturers' Association closed its thirty-eighth annual convention February 10, at the Jefferson Hotel, in Peoria, Ill. It had spent three days of the most instructive and constructive work in its career, and when, during an early session, John L. Buckley, of Aledo, the retiring president, paid a glowing tribute to A. E. Huckins, the true-and-tried secretary, every man present knew that it was more than deserved.

Few, however, knew of the many things that were in store for them—largely the result of Mr. Huckin's ability to plan for the future and accomplish in the present.

With this meeting, unless indications are unreliable, a turning point has been reached in state association work. This will be accomplished by dividing the organization into a number of "groups"—each one made up of manufacturers of a different variety of burned clay material—and then arranging for the massing of these "groups" only to hear papers and discuss problems that apply to all, the balance of the time being spent in group meetings. It is believed that this will allow many times the amount of work that is now being done in the short time allotted to the convention.

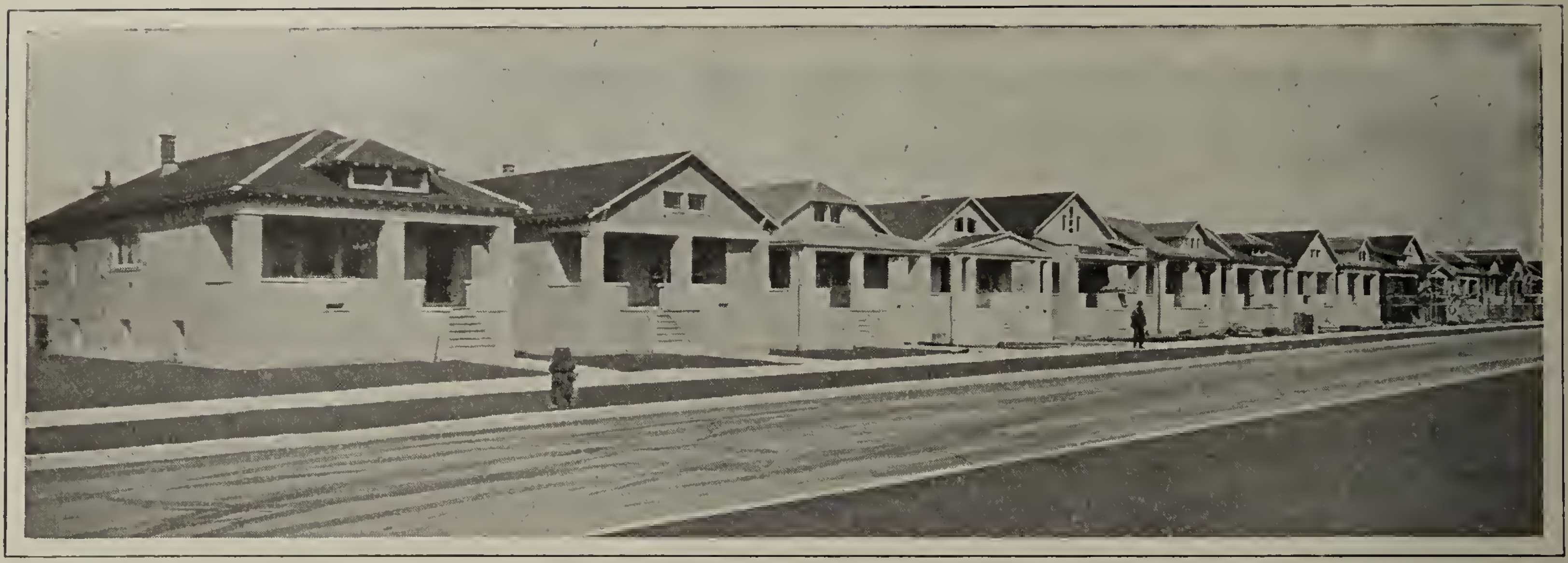
In this way, too, papers that, while very valuable to some manufacturers, are almost useless to others, will be read before group meetings of men that are vitally interested in the subject under discussion. At the same time, other papers, equally valuable to men making other clay products, are being read before other group meetings, and discussed by men who understand their value.

The idea of this change in program is to be credited to Mr. Huckins, and the manner of its reception indicates that it will have a very hearty and loyal support.

An unusually large representation from Urbana and Champaign marked the opening session, which was held Tuesday morning, February 8. Conventional addresses of welcome were made and responded to, and then the convention "got down to business." The first paper—"Pyrometers," by J. W. Lazear, created an extended discussion, in which the use of pyrometrical apparatus was shown to have been successful on a number of plants—one case in particular being mentioned by a manufacturer of face-brick, who said when the pyrometer came in, the independent burner went out. Now the plant is independent of the independent burner, and also makes better brick.

Barney S. Radcliffe, A. B., instructor in ceramics at the University of Illinois, gave a graphic paper on the changes and variations in shrinkage and other burning properties of brick, caused by the addition of sand to two typical

(*Continued on page* 349)



Partial View of a Row of Twenty-five Hollow-tile Bungalows in Rogers Park, a Suburb of Chicago, Ill.

A CONVERTED CARPENTER *who now builds* WITH BURNED CLAY

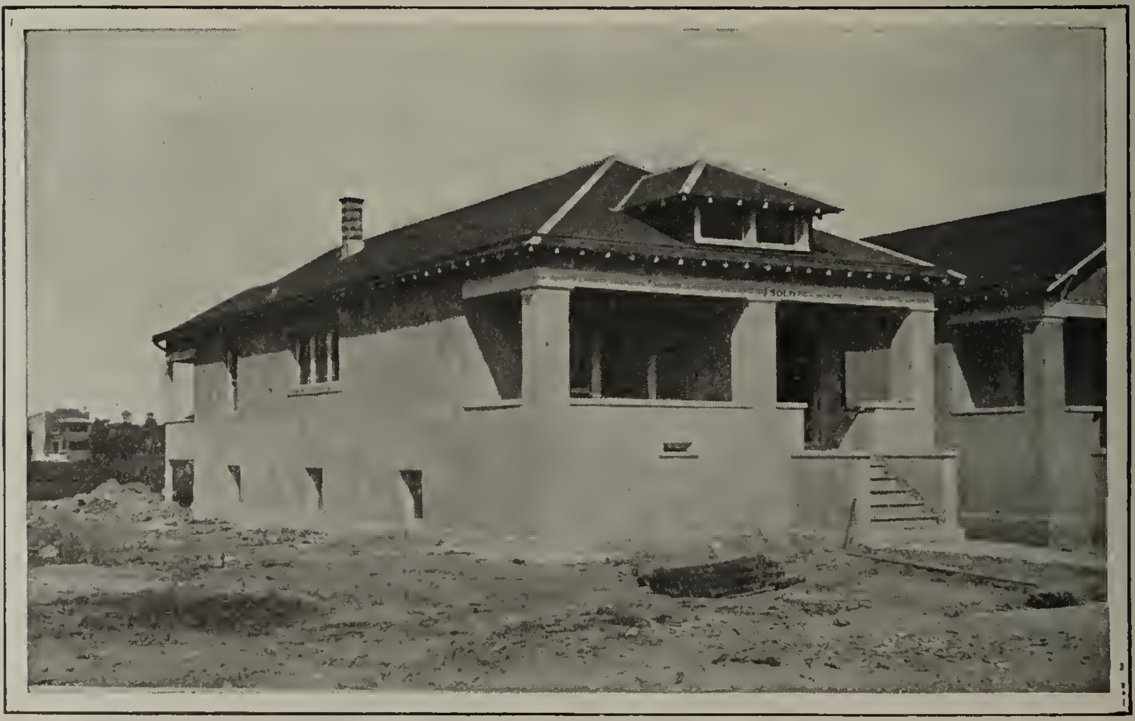
Showing How Specializing in Low-cost, Fireproof Homes Has Brought a Rich Reward to a Far-Sighted Contractor

THE CONTENTION that it is profitable for a man to be a specialist was never demonstrated to better advantage in the building field than in the case of Niels Buck, a Chicago architect-builder, who for more than twenty years has concentrated his efforts in the erection of buildings of a size and cost appealing to the man commanding a moderate salary. Mr. Buck's activities during this extended period qualify him as an expert in this class of low-cost construction and equipment, and his methods are an object lesson which illustrate the advantages of buying in large quantities and the continuous employment of workmen who become exceptionally efficient thru their familiarity with one type of structure. It has been his practice to erect rows of residences which are sold on the installment plan, and during the course of construction, prospective owners are presented with the opportunity of visiting the buildings with a view to introducing certain touches of individuality in the exterior and interior treatment. In regard to his ability to produce bungalows much below the average cost, Mr. Buck presents the following interesting comments:

"In response to a demand for commodious bungalows of modern construction and equipment, I have built during the past year several rows of such homes in Rogers Park, one of Chicago's growing north side residence districts. I have reason to believe that for the average family the best type of structure is one embodying an attractive arrangement of large living and dining roms, two bedrooms, bathroom and kitchen, while the plans would be incomplete without the inclusion of porches. An examination of the accompanying floor plans shows that front and rear porches are provided for every home.

"My initial enterprises in Rogers Park consisted of frame bungalows, but recently I have been impressed with the idea that people are getting educated to the fact that fireproof homes can be built at a cost comparing most favorably with frame construction, and as a result, two rows of fireproof bungalows consisting of twenty-five each are now rapidly nearing completion.

"Construction on such a scale as this means that I have to purchase materials in large quantities. This situation insures my getting excellent prices from manufacturers and enables me to reduce my costs and overhead expenses.



A Close-up View of One of the Six-Room Houses

Looking Down Another Street of Fireproof Homes in Which the Variation in Architecture is a Noteworthy Feature

"Another important feature is that of labor. My men are so accustomed to this class of construction that it is not necessary to have a foreman supervising each stage of the work. For instance, when the carpenters start to frame a house, they know that the girders, beams, joists, lathing, etc., require materials of a certain size, and with this knowledge they are able to go right ahead with the work without the least hesitation. Thus lost time is eliminated.

"When a prospective owner comes to me regarding the purchase of a fireproof house, I am well fortified with arguments which cannot fail to convince him that the hollow-tile house is the one he wants. With this type of construction the cost of maintenance is extremely low, insurance rates are much cheaper, much of the danger of conflgration is eliminated, and it has been proven that the tile home is warmer in the winter months and cooler in the summer season than is the ordinary frame building.

"In order to be consistent I naturally select non-inflammable shingles. It would be folly to place an inflammable roof on an otherwise fireproof residence, as in most cases the spreading of fire, in residence districts at least, is caused by burning brands falling on inflammable roofs.

"Further on is an estimate of cost of a five-room bungalow, not including, however, sidewalks, street improvements, concrete fencing, and new sewers, for which the owner has to pay. Including these items the cost ranges from $3,100 to $3,500, the latter figure being for the six-room bungalow.

"An examination of the typical floor plans reproduced herewith reveals a well lighted and comfortable lay-out in both the five and six-room homes, the only difference being that the larger building has an additional bedroom. The bungalows are 47 x 24 ft. in plan, the five-room size being divided into living room, 17 ft. 4 in. x 12 ft.; dining room, 16 ft. x 11 ft. 6 in.; bedrooms, 11 ft. 9 in. x 10 ft. 4 in., and 10 ft. 9 in. x 10 ft. 4 in.; kitchen, 11 ft. x 11 ft. 6 in.; bathroom, 10 ft. 4 in. x 5 ft. 6 in.; front porch, 24 ft. x 7 ft.; rear porch, 8 ft. x 14 ft.

"In the six-room home, the living and dining rooms are sacrificed somewhat in order to accommodate the additional bedroom. The living room is 16 ft. x 12 ft. 2 in.; dining room, 13 ft. 8 in. x 12 ft. 2 in.; kitchen, 10 ft. x 12 ft. 2 in.; bedrooms, 11 ft. 6 in. x 9 ft. 6 in., and two 13 ft. x 9 ft. 6 in. The bathroom measures approximately 7 x 7 ft. The front porch runs the entire width of the building, while the rear porch in the six-room structure is 8 ft. x 8 ft. 8 in.

"It will be apparent from this data that the average small family finds such a residence ample for its needs. The rooms are compact in every instance. Rear porches are adjacent to the kitchen and may be utilized as a breakfast porch and sewing room. Fireplaces are built in the living rooms according to the owner's taste. Each dining room has a buffet china closet. Bedrooms have roomy closets and kitchens are provided with pantries equipped with the necessary shelving and cases. All vestibules are finished with a tile floor, which allows mud and dirt to be cleaned off rapidly. The equipment includes an automatic gas water heater and laundry trays in the basement, a complete bathroom and an efficient plumbing and heating system."

A Five-room Hollow-tile Bungalow Built by Niels Buck

According to the specifications the 12 in. foundation walls and 24 x 24 x 10 in. footings are of concrete, composed of one part Portland cement, two parts sand and four parts broken stone. The exterior walls are built of 8 x 12 x 12 in. hollow-tile. The mortar used in laying the blocks was made up of one part Portland cement, two parts lime and three parts sand. The exterior walls when dressed are 10 in. thick, all plastering being two-coat work applied directly to the walls, with a dash coat of stucco of selected shade.

The basement floor is entirely of concrete, 4 in. thick, resting on a bed of cinders, the forming mixture containing the same ingredients, and proportions as the foundations. A top coating 1 in. thick is well troweled and pitched to the floor drain. Concrete steps lead to the basement from grade in the rear of the building.

Lally columns filled with concrete support the 4 x 8 in. girders. The floor joists thruout are 2 x 10 in.; ceiling joists, 2 x 6 in., and the rafters supporting the main roofs and dormers, 2 x 4 in., all spaced 16 in. on centers. Wall plates are 2 x 8 in.

Interior partitions are of frame construction 6 in. thick, lathed and plastered. All floors are double, the underflooring consisting of 1 x 6 in. clear yellow pine which is covered with one thickness of building paper. The interior plastering is two-coat work, the second coat being a hard finish.

The window frames are built of Norway pine, and the sills are of 1¾ in. cypress. Windows are double hung except in the dining room, which has French windows of white pine. Porch floors are made of 1 x 4 in. clear spruce, and porch ceilings of 1 x 4 in. beaded yellow pine being constructed.

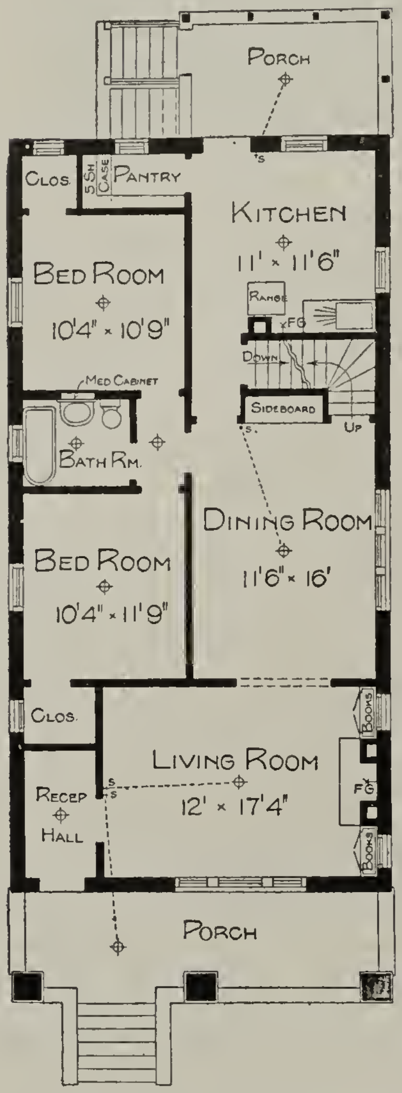
The sheet metal work for downspouts, gutters, ridges and flashing is of 26-gage galvanized material.

The floors in the living room, dining room and bedrooms are 2¼ in. first and second quality red oak, and the kitchen and pantry floors are 2¼ in. clear maple. The dining room trim is oak, and the living rooms have birch, with a mahogany finish. Kitchen trim is left natural and bedrooms are finished in white enamel. Oak and birch trim received one coat of stain and two coats of varnish.

The front doors are 1¾ in. thick and the interior doors 1⅜ in. thick, of one-panel stock conforming to the trim of the rooms to which they give access.

The hardware thruout has a lemon brass finish. The buildings are piped for gas and wired for electric lighting.

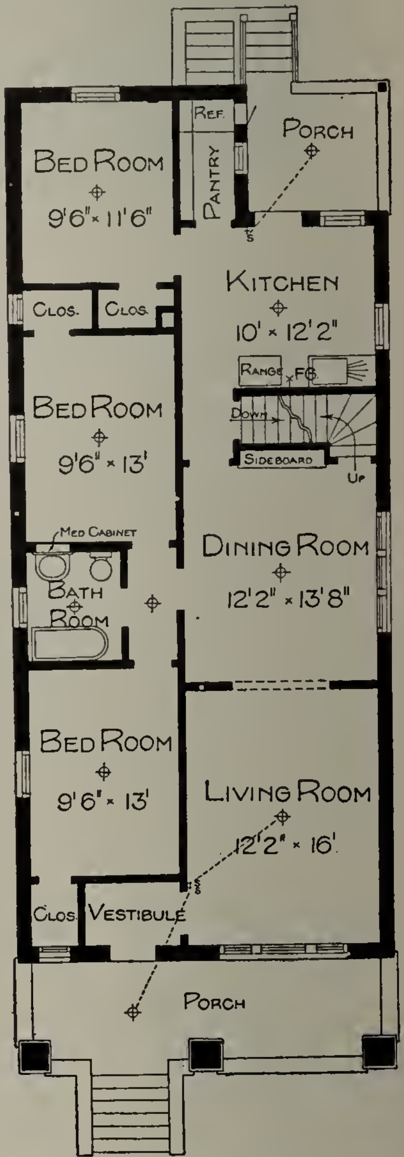
The above figures covering the principal classes of work in connection with a typical five-room bungalow are likely to prove of interest.—"Building Age."



Floor Plan of Five-room House

ESTIMATE FOR THE FIVE-ROOM HOUSE

Excavating and Grading		$100
Masonry Work:		
Foundations	$245	
Cement Floor	65	
Chimney	22	
Setting Hollow-tile	220	
Hollow-tile	173	725
Plastering		175
Stucco		185
Carpentry		350
Millwork		250
Hardware		50
Tile Floors, Bathroom & Vestibule		25
Metal Work		35
Roofing		115
Glazing, Shades, Screens		60
Painting, Staining & Tinting		125
Heating		240
Plumbing & Gas Fitting		250
Electric Lighting & Fixtures		100
Total		$2,785



Floor Plan of Six-room House

Hollow-Tile Floor Stands Government Test

A very interesting test of hollow building tile has been made by the United States Bureau of Standards, at Pittsburgh, Pa. A floor slab of hollow tile, six feet wide and thirty feet long continued over the three piers fifteen feet apart. The tile was of a special type for use in floor slabs and was made so that the bottom surface was about 2 inches wider than the top. In laying the tile in the form of a slab, the pieces touch on the bottom, but are about 2 inches apart at the top. This space continues throughout the length of the slab, and is filled with a mortar of the composition of one part of cement and two of sand, in which are placed several reinforcing rods bent up at the ends of the slab and continued through the concrete beam into the next adjacent hollow-tile slab.

In the present case the two slabs were allowed to age for one month. Tests were made of these, loaded uniformly with pig lead, numerous deflection readings being made as different loads were applied. One of the slabs failed at about 603 pounds per square foot. The other was able to withstand a slightly greater load, 690 pounds per square foot. Failure occurred in the mortar beams, due largely to the inferior grade of reinforcing used. One of the concrete supporting piers also failed near its base. While the load carried was not up to the expectations of the manufacturers of the tile, yet it was considerably in excess of that demanded by most building laws.

MAKING SILICA BRICK
for BY-PRODUCT COKE OVENS

A Paper Read Before the San Francisco Meeting of the American Institute of Mining Engineers, September, 1915

By Kenneth Seaver, B. S.
(*Asst. Genl. Sales Mngr., Harbison-Walker Refractories Co.*)

(*Concluded from February 1 Issue*)

Now, in every burned silica brick expansion will occur on heating—a true thermal expansion, identical in its general character with that incident to the heating of practically all bodies. Such thermal or temporary expansion will disappear upon cooling, and being the expression of the coefficient of expansion of the silica it is unavoidable. But it is argued that, if a silica brick is not properly burned, then, upon reheating in actual coke-oven practice, there will be not only a normal thermal expansion but an additional expansion of indeterminate amount which will be permanent. It is essential in the construction of the coke ovens that the expansion, whatever its nature, be as small as possible, and that, whatever it is to be, it be known and adequately cared for.

It will be recalled that the silica brick under consideration is made merely by adding 2 per cent by weight of milk of lime to quartzite rock of the following composition, say:

	Per Cent
Silica (SiO_2)	97.80
Alumina (Al_2O_3)	0.90
Iron peroxide (Fe_2O_3)	0.85
Lime (CaO)	0.10
Magnesia (MgO)	0.15
Alkalies	0.40
	100.20

The representative silica brick produced may be assumed to have the following composition:

	Per Cent
Silica (SiO_2)	96.25
Alumina (Al_2O_3)	0.88
Iron peroxide (Fe_2O_3)	0.79
Lime (CaO)	1.80
Magnesia (MgO)	0.14
Alkalies	0.39
	100.25

What are the changes which occur as the siliceous mass is burned?

Certain of these are obvious, such for instance as the formation of a bond of one or more of the lime-silica compounds such as the meta-silicate CaO, SiO_2 or the ortho-silicate 2CaO, SiO_2. With the exception of the lime present, the peroxide of iron and the alumina, tho small in quantity, are the preponderating impurities and there is undoubtedly formed a certain amount of silicate of iron as well as compounds of the lime-alumina series. Whereas the lowest melting point incident to any eutectic of the lime-silica system is 1,436 deg. C. (2,617 deg. Fahr.) and of the alumina-silica series is 1,610 deg. C. (2,930 deg. Fahr.), while that of the lime-alumina system is 1,400 deg. C. (2,552 deg. Fahr.), some of the eutectics of the ternary system CaO, Al_2O_3, SiO_2 melt at approximately 1,170 deg. C. (2,138 deg. Fahr.) and are thus among the first of the flux compounds resulting.

No less important, though less recognized, changes are occurring in the brick as it is heated. The evidence of the change, regardless of its reason, is easily indicated by the most casual measurement when brick are drawn from the kiln from time to time, as higher temperatures are reached. The final expansion will be very close to 38 in. per foot.

The valuable work done by Day, Shepherd and particularly by Fenner, on the Stability Relations of the Silica Minerals ("American Journal of Science") give the results in a large field of laboratory experiment, which make possible a fair understanding of what occurs in the actual burning of the silica brick. Fenner's work was to establish among other things the relations between the minerals quartz, tridymite, and cristobalite, all silica minerals and any of which could be converted into any other by appropriate heat treatment. For the purposes of this discussion it is unnecessary to touch upon the alpha and beta phases of these minerals. In substance, the results under the conditions imposed by the experiments were that powdered quartz, if heated, remains quartz until a temperature of 870 deg. C. (1,598 deg. Fahr.) is reached, at which inversion point there begins a slow change to tridymite. If heat is still applied, there is no further change from tridymite until 1,470 deg. C. (2,678 deg. Fahr.) is reached, when inversion to the form of cristobalite has its beginning. There is no further change until the cristobalite may melt into a glass. Thus the stable phase of quartz (quartzite rock as applied to silica-brick manufacture) extends to 870 deg. C. (1,598 deg. Fahr.). Between 870 deg. C. (1,598 deg. Fahr.) and 1,470 deg. C. (2,678 deg. Fahr.) the stable phase is tridymite, while above 1,470 deg. C. (2,678 deg. Fahr.) cristobalite is stable.

As a whole it must be carefully noted that the changes from one mineral to another were exceedingly slow, particularly near the inversion points. So slow in fact were the alterations, that the melts were made in a flux of a large excess of sodium tungstate which acted as a flux or catalyzer. The powdered quartz or whatever might be the silica mineral under study was stirred into the molten bath of flux and the platinum container was then treated in a suitable furnace. This flux in no way entered into chemical combination with the silica but only aided and quickened its action, apparently furnishing a fluid medium through which the molecular rearrangement was facilitated. In spite of this, the slowness of the inversion, often requiring many hours, will bear emphasis in drawing conclusions regarding any parallelism between these experiments and the burning of brick.

A particularly noteworthy fact is that in the absence of a flux or catalyzer, the inversion from quartz to tridymite does not occur, but the inversion is direct to cristobalite, and there is a shift in the inversion point to as low as 1,000 deg. C. (1,832 deg. Fahr.) while at 1,300 deg. C. (2,372 deg. Fahr.) the change is very rapid.

This entire absence of tridymite in quartz heated well above 870 deg. C. (1,598 deg. Fahr.) the quartz-tridymite inversion point, although difficult of explanation, is apparently proved. As indicative of the time element requisite for such an inversion, in one experiment fine-ground quartz heated 108 hr. at 1,250 deg. C. (2,282 deg. Fahr.) without flux gave but a small percentage of inversion while with 90 hr. at 1,360 deg. C.

(2,570 deg. Fahr.) approximately two-thirds became cristobalite.

In considering these changes in the crystalline form of silica, some of the characteristic properties of the three will not only make clearer the method of distinguishing them, but also throw some light on the reasons for the effects these inversions exhibit.

Quartz has a specific gravity of 2.65, tridymite of 2.27, and cristobalite of 2.33. Each has its characteristic crystal form, the quartz being usually in the familiar pyramids, prisms of combinations of these. Tridymite often occurs in thin tablets or plates hexagonal in shape. Cristobalite is exceedingly irregular in the development of its crystal form but often develops octahedral caps along the closely interlacing axes of elongation.

It is the difference between the indices of refraction of these minerals, however, that furnishes the greatest aid in distinguishing the one from the other.

Tests.—As a starting point from which to work in determining the effect of burning, a set of sample silica brick were taken from one kiln, all from the same zone and from a kiln of absolutely normal burn. In this instance they were first burned at a point about 8 ft. from the wall and 6 ft. from the bottom. This sample was divided into three parts, one to be kept unaltered, one to be reburned under the same conditions, and a third to have two reburns. In addition to this, pieces of quartz rock received one and two burns respectively, with the view of obtaining the same data.

The primary object was to determine, if possible, how far the inversion from quartz to cristobalite had progressed under the successive conditions. Each burn was made as nearly uniform as practicable, and in each succeeding burn the effort was made to maintain identical conditions. At that part of the kiln where these brick were burned the temperature reached 1,540 deg. C. (2,804 deg. Fahr.), and they were subjected to that heat for approximately 40 hrs.[*]

In general, the chief optical constant serving to distinguish cristobalite on the one hand from quartzite and calcium silicate on the other was the index of refraction. The slow ray of quartz has a refractive index of 1.544 while the index of the fast ray of cristobalite is about 1.485. The immersion method was used to determine the indices of the grains, the powdered brick being immersed in a liquid of index 1.51. By this method it was possible to distinguish between the higher-refracting quartz and calcium silicate and the lower-refracting cristobalite.

With the aid of a *camera lucida,* the fields were sketched on very thin tracing paper. The grains, as represented on the paper, were then cut out and weighed for each constituent. Aside from the fact that the composition of different fields may vary, other errors are entailed in the sketching, cutting out and weighing so that a variation of 5 per cent is justifiable. In these determinations the fields of the same specimen checked to within 5 per cent maximum and 1 per cent minimum error.

Results.—The tabulated data are as follows:

Specimen	Field	Quartz and Calcium Silicate, Per Cent	Average, Per Cent	Cristobalite, Per Cent	Average, Per Cent
Lot 1....................	1	24.87	....	75.13	....
(1st burn)......	2	20.42	22.65	79.58	77.35
Lot 2....................	1	14.31	....	85.69	....
(2d burn)......	2	19.96	17.13	80.04	82.87
Lot 3....................	1	17.44	....	82.56	....
(3d burn)......	2	14.60	16.02	85.40	83.98
Quartz rock......	1	50.08	....	49.92	....
(1st burn)......	2	51.05	50.57	48.95	48.95
Quartz rock......	1	32.70	....	67.30	....
(2d burn)......	2	30.06	31.38	69.94	68.62

A number of interesting deductions may be made even from these preliminary tests. The maximum change takes place at the first burning, followed by a further appreciable inversion at the second, and practically no change at the third.

The grain structure of the reburned silica brick may throw some light on this subject. Here the grains may be seen to be essentially cristobalite, with the quartz occurring as an inclusion. The last stages of the inversion are apparently exceedingly slow within the protecting envelope.

The smaller percentage of inversion in the case of the quartz rock as compared with the brick is very noticeable, and is undoubtedly due to the grinding of the quartz in the manufacture of the brick. This is wholly in line with Fenner's laboratory experiments, in which he found the influence of comparative grinds to be slight if the silica mineral were heated with a flux, but to be marked if the material were heated without a flux. Fine grinding greatly hastened the inversion. The greater freedom of movement in expansion as compared with the exceedingly dense quartz body is probably the controlling factor, rather than any difference in the penetration of the heat.

The part played in the inversion (if any part is played) by the lime and its compounds present, is of much interest. It appears logical that the greater fluidity conferred by the fluxes present should have an influence; but it must be borne in mind that, as compared with previous experimental work on silica minerals, the amount of flux present in the brick is exceedingly small, and that definite chemical compounds are formed in combination with the brick body. In Fenner's work the sodic tungstate formed no such chemical compounds, and remained unchanged at the conclusion.

The fact moreover that no tridymite was determinable in either the burned brick or the calcined quartz indicates that the burning of silica brick is closely comparable to heating the quartz without a true flux or catalyzer; for did the impurities of the rock and the added lime act in that manner, tridymite would undoubtedly be distinguishable.

Thus far, we have assumed the changes in crystal form to be desirable, because of their effect on the expansion of the material.

EFFECT OF BURNING ON PHYSICAL STRENGTH

It is also of interest to note the effect of the reburning on the physical strength of the brick. To determine this, the following tests were run:

Cross-Breaking or Modulus of Rupture Test

Number of Burns	Mark	Breadth of Brick, Inches	Depth of Brick, Inches	Weight Causing Fracture of Brick, Pounds	Length Between Supports, Inches	Rupture, Pounds	Average, Pounds
1	9 A	2.46	4.40	3,550	6	671	....
1	9 A	2.42	4.40	3,000	6	567	624
2	9 B	2.50	4.50	4,140	6	730	....
2	9 B	2.50	4.50	5,000	6	889	809
3	9 C	2.06	4.50	4,500	6	971	....
3	9 C	1.92	4.50	4,550	6	1,031	1,001

Crushing Test: Whole Brick Crushed Flat

Number of Burns	Mark	Dimensions, Inches	Area, Square Inches	Load, Inches	Crushing Strength Per Sq. Inch, Lbs.	Average, Lbs.
1	9 A 2	9.00 by 4.40 by 1.96	39.60	176,800	4,465	....
1	9 A 2	9.04 by 4.44 by 2.04	40.14	167,000	4,161	4,313
2	9 B 2	9.10 by 4.46 by 2.02	40.58	186.500	4,596	....
2	9 B 2	9.10 by 4.40 by 2.06	40.04	168,000	4,196	4,396
3	9 C 2	9.06 by 4.42 by 2.00	40.04	195,000	4,870	....
3	9 C 2	9.12 by 4.46 by 2.06	40.68	168,000	4,130	4,500

The increased strength of the brick is evident.

Conclusions.

In considering whether or not all the expansion possible is burned out of the brick, it is necessary to determine first the limits and then how closely they are approached.

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[*] The heartiest appreciation is here expressed to A. A. Klein, Petrographer in the U. S. Bureau of Standards at Pittsburgh, for his courtesy in making these determinations that they might be concluded in time for presentation here. The quality of Mr. Klein's work needs no comment.

Day, Sosman and Hostetter say that the true specific volume of cristobalite as compared with quartz at 20 deg. C. is 13.4 per cent greater. Assuming a green brick to be wholly pure quartz (100 per cent SiO_2), and the brick burned from it wholly cristobalite, the volume increase would then be 13.4 per cent. This theoretically possible expansion is diminished by the effect of the impurities present in the actual brick, and by the resulting compounds formed. For instance, 4 per cent of impurities would produce a much larger porportion of compounds to which this expansion formula does not apply.

An expansion of, say ⅜ to 7/16 in. per foot, to which by-product coke-oven silica is burned, thus provides for somewhat more than 13 per cent increase in volume.

It must be borne in mind, however, that by quick burning the brick may be easily expanded by double or treble the normal amount; but sound brick do not result. This excessive expansion is due to minute fissures opened up in the body of the brick by a too sudden rise in temperature during burning. In the early stages of firing the heat must be raised very slowly. In general the conclusion is justified that the present good commercial practice carries the results of the quartz-cristobalite inversion to the greatest degree economically possible and that the measure of the expansion of the brick affords a closely approximate measure of the inversion—providing only that the brick are sound.

The short series of tests outlined above are given with full realization that, while indicative, they are by no means conclusive. They were but the preliminary runs, necessarily made somewhat in haste, but giving data which permit intelligent plans to be made for the more comprehensive tests now under way. There is much to be learned as to the effect of both time and temperature as well as the influence of pressure, which may produce a shifting of some of the inversion points. Judging from the work thus far done, it is impossible to expect the full inversion of quartz to cristobalite under any practical operating conditions of manufacture.

INCREASING *the number of* MASON CONTRACTORS

Iowa State College to Start Course Whereby Simple Architectural Drafting Will be Taught to Young Brickmakers

HOMER F. STALEY
Secretary, Iowa Clay Products Association

B. C. KEELER
President, Iowa Clay Products Association

WHEREAS, manufacturers of brick and other building materials made from clay have unfair competition with lumber in the sale of their ware for moderate-priced homes and farm buildings for the reason that there are few artisans who are able and capable of designing and constructing buildings of brick and hollow-tile; Therefore; be it resolved that our association respectfully ask the officials of the Iowa State College to investigate the feasibility of establishing a course of instruction to teach brick masons and others the designing and construction of small home buildings of brick and hollow-tile and to provide for the course at an early date."

Thus was a worthy movement—the development of mason contractors—given a big impetus at the annual meeting of the Iowa Clay Products Manufacturers' Association held at Ames, February 3 and 4.

The action which culminated in the above resolution was a direct result of a very interesting and instructive talk on "Forcing Our Way to a Larger Market," by Dr. G. C. Mars of the Hydraulic-Press Brick Company. Dr. Mars brought his address to a climax by stating that the one big obstacle to the extension of the clayworkers' market into the enormous field of moderate-priced buildings—now so largely occupied by the lumberman—was the lack of masons who had even an elementary knowledge of designing and draftsmanship.

In the discussion that followed this talk, it developed that the faculty of Iowa State College had already given some thought to this matter and had decided that if a sufficient number of young men could be found who would be willing to enter such a course of mason contracting, the college would provide an instructor. But it went further than this. Following the example of the Almighty who told Abraham that He would not destroy Sodom if a certain number of good men could be found therein, the faculty said that if the clay products manufacturers of the state would furnish twelve young men for this course, it would furnish a teacher and the offer would not be lost. From the action taken at the recent convention, it looks very much as though "Sodom" would not be destroyed, since those present pledged their support in obtaining the required number of entrants.

The convention was successful in all that the word applies. About seventy-five were present thruout the sessions, this number being featured by a contingent of twelve clayworkers from Nebraska.

A business session of the Permanent Buildings Society was held on Wednesday, February 2. The report of the secretary, Matt. L. King was very inspiring and fully vindicated the belief that organized promotion surely pays. "We are going to push clay products so hard in this state," declared H. R. Straight, who is president of the society, "that no manufacturer of burned clay material can afford to withhold his membership."

The convention of the larger or state association opened on Thursday morning, February 3, the election of officers and reports of the secretary and treasurer being the principal business transacted at this session. B. C. Keeler, who was unable to be present because of illness, was re-elected presi-president, H. R. Straight treasurer and Homer F. Staley secretary to succeed C. B. Platt of Van Meter. It was the feeling of those present that the election of Mr. Staley as secretary would aid considerably in the development of the association's work along ceramic lines and furthermore, it was the desire of Mr. Platt to surrender his time-honored office, as he already holds a prominent place in the Permanent Buildings Society. One paper was read at the Thursday morning session—that of Prof. A. V. Bleininger of the U. S. Bureau of Standards on the "Control of Burning."

President Raymond A. Pearson of the Iowa State College appeared at the opening of the afternoon session to welcome the delegates, being followed by a paper on "Public Records of Farm Drainage Systems and Their Effects in Promoting Drain Tile Sales," by John W. Anderson. Then came the address of Dr. Mars which has already been commented upon. "Selling Brick to the State," was an interesting topic chosen by Leon C. Goodman of the Des Moines Clay Company. His talk resulted in a resolution protesting against prison competition. Following Mr. Goodman three papers were read, one on drying clays, by Harold Copping, one on efficiency engineering by Dwight T. Farnham and the last, one asbestos as it relates to the clay products industry, by A. H. Roberts of Chicago.

On the evening of February 3, an informal "mixer" was held in the engineering hall of the college, the most prominent feature being a stereopticon lecture by Matt. L. King on "Clay Products for Farm Buildings."

On Friday morning February 4, Prof. Bleininger started a busy day by reading a paper on the "Elimination of Lime Pebbles from Clays." Prof. Charles F. Binns of the New York State School of Clayworking and Ceramics followed with a paper that was originally scheduled for the preceding day, on "Defects in Manufacture Arising from Chemical Composition—Scum, Whitewash, etc." Daniel Reagan of Columbus, Ohio, then explained some original processes for the manufacture of rough-textured face-brick and lug paving-brick. "The Efficiency of the Crude Oil Engine" was the subject chosen by H. W. Wagner, Mechanical Engineer of the Iowa Engineering Experiment Station, he being followed by Prof. Cleghorn of the Department of Mechanical Engineering, Iowa State College, on "The Manufacture and Use of Producer Gas." Earnest H. Gaunt of Boston, Mass., then gave a talk on "Co-operation—the Way Out for American Business Men." Prof. Binns read another paper on "Defects in Manufacture Arising from Manipulation and Physical Conditions—Lamination, Differential Flow, etc."; Mr. Wagner on "Tests of the Heating Value of Coals from Iowa and Other States" and "Freight Rates on Clay Products" by George A. Wrightman, secretary of the Iowa Manufacturers' Association of Des Moines, which closed the session of February 4.

Incidently it might be mentioned that Prof. Staley was largely responsible for the quality of the program, having worked unceasingly for several weeks prior to the date of the convention. The sessions were held at the same time as "Farmers' Week" an annual event at the college. Some twenty-two hundred rural citizens, boys and girls registered for the various lectures offered in farm subjects. The fact that so many manufacturers where present gave them an opportunity to talk clay products to the farmers between classes, and undoubtedly resulted in a large amount of business. A small exhibit of brick and hollow-tile was erected in the old agricultural hall of the college.

"Movies" Feature of Adel (Ia.) Short Courses

The "short course" for contractors arranged by the Adel (Ia.) Clay Products Company and staged at its plant, which proved so successful last year, was repeated on January 25, 26 and 27, with a larger attendance than at the previous sessions. The program followed along last year's lines and consisted of a series of talks and demonstrations in the correct use of clay building materials.

On the first day of the "course"—Tuesday, January 25—Prof. Homer F. Staley of Iowa State College read a very good paper comparing clay products with other structural materials from the standpoint of permanency, and gave definite reasons why well made burned clay wares are everlasting. Wilfred D. Holtzman, Jr., a somewhat recent recruit of the Adel Company and who is now serving them in an architectural advisory capacity, gave a talk on "Architecture in Permanent Homes." "Fireproof Tile Floor Construction," followed, being ably presented by Matt. King. In the afternoon three demonstrations were given, the first by W. B. Smith, who is field supervisor of the Adel Company's construction work. Mr. Smith showed how to lay up rough-textured hollow-tile and secure a good job. A new type of burned clay barn roof and some tests of mortar mixtures closed the day.

The first day's classes in the "course" covered the building of homes, barns and other rectangular buildings. On Wednesday, January 26, corn-cribs, with and without granaries and other auxiliaries, were covered, five papers and two demonstrations being devoted to the discussion of these subjects. Thursday, January 27, the last day of the "course" was given over to silos and farm buildings.

One of the interesting demonstrations given at this "course" was by Matt. King when he removed the weight of 30,160 pounds from the experimental hollow-tile floor which was described in the January 4 issue of this magazine. After having been thus loaded for three months, the floor came back to practically its original level, apparently not having been damaged in any way. It should be remembered that the weight placed on this floor was three times as large as it was designed to carry and was concentrated at the center of the 20-ft. by 20-ft. span where a pressure of 470 pounds per square foot was exerted.

On the evening of the closing day of the course, two special reels of moving pictures which brought out the fire-resisting qualities of burned clay were exhibited at a local theatre. Not only were those who attended the "short course" invited to see these pictures, but the townspeople were permitted to come into the exhibition free of charge. Many hundreds saw the pictures, which with two reels of a lighter character, pleased the audience immensely.

DON'T FORGET!

"Brick and Clay Record" will be at home to its readers and advertisers, Feb. 21 to 25 at Room 341, Hotel Statler.

The SUPERINTENDENT

Helpful Hints for Practical Men Whose Problem is Maximum Production With Minimum Cost

WASTE, according to foreign scientists, is the cardinal sin of the American people. Without going further into the discussion of the merits of this statement or to seek out the reasons for such a condition existing, suffice it to say that waste is a common fault on the clay plant, whether it be in labor or materials. Some interesting thoughts on the inefficient use of one of these materials—coal—were given in a paper read before the recent convention of the Northwestern Clay Association, by W. B. Grover of Minneapolis. Mr. Grover said:

CUTTING DOWN THE COAL BILL

I will endeavor to tell you about the burning of coal and why it is that such a large number of plants are only getting forty per cent of its value instead of about seventy-five per cent when burned under a boiler. I believe that what is true of coal consumed in this way is also true of fuel that is used in the burning of brick or other clay products.

In the first place, starting with the size of grates, I figure that for all eastern coals such as Pocahontas, Youghiogheny, Hocking and Splint, a ⅜-in. grate opening is sufficient—that is, this opening is large enough for any coal that has from five to seven per cent of ash on an analytic basis.

Now, the per cent of ash, which is unburned carbon or coke, depends to a large extent upon the fireman and the area of grate openings. For instance some firemen will run a slice bar over the top of the grates, mixing impurities with the fire and causing a large amount of unburned coal to fall thru the grate into the ashpit. This method of breaking up fires leaves holes and allows an excess amount of cold air to pass thru. The correct way to break up a fire, when this is necessary, is to take a two-prong hook and break it from the top. This method leaves the impurities on the grates and levels the fire, accomplishing much more than the slice bar and preventing the unburned carbon from falling into the ashpit. I have found plants where the grate openings were from ½ to ¾-in., that the per cent of ash was as high as from fifteen to seventeen, while an analysis of the same coal only gave six per cent.

MUCH DEPENDS UPON THE FIREMAN

The method of firing coal is very important. Just how far fuel waste can be eliminated, depends upon it. The first thing a fireman must take into consideration is that it requires heat to form carbon or coke, and if he is "on the job," he can tell at a glance whether he has a hot fire or not. It is impossible to lay down a set of rules whereby a fire may be carried. The amount of draft available makes considerable difference. For instance, in a plant with a poor draft, the fireman must carry a thin fire. A thin fire is from three to five inches in thickness. In the event of a poor draft, the fireman has to work harder to get results.

Turning to instances where there is an excess of draft, fires must be heavy or dampers partly closed. It has been my experience, however, that not more than a quarter of the power plants have dampers that can be regulated by the fireman without using a stepladder or a wrench. Under such conditions, the owner should not expect to get the most out of his coal. All fires should be controlled by the damper and not by ashpit doors. If there is a good fire and the doors are closed, there is a tendency to warp or burn the grates.

The bridge wall of a fire-box should be high enough so as not to cause friction with the gases and yet allow these gases to pass over the wall on a sharp angle into the combustion chamber where there is a partial vacuum or dead air space. The combustion chamber, which means that part of a boiler into which the hot gases pass, expand and then give up their heat, is of considerable importance. I have gone into a large number of plants and found these chambers obstructed. In one instance I noticed that the combustion chamber was filled with ashes to a point about six inches from the boiler. I remarked to the superintendent and engineer that this was a large amount of ash to collect in the chamber for one run but, to my surprise, was told that these ashes were never cleaned out as it was desired to get the heat close to the boiler. This same concern was complaining that it was not getting the results from its coal that it should.

Now as regards the tubes or flues of a boiler. These should be scraped or blown every eight or twelve hours as a ¼-in. soot or sediment requires twice the amount of fuel to do the same amount of work. It is very important that all brickwork around the boiler and firebox be tight because on the outside of the furnace there is atmospheric pressure and on the inside there is a partial vacuum. Even the smallest hole admits a large amount of air. A good method for finding holes in the brickwork is to use a lighted candle, noting if the flame is drawn from its perpendicular position.

DRAFT GAUGE HELPS REDUCE EXCESS AIR

We have now gone over the burning of coal and have learned of a few points that should be watched in order to reduce the fuel waste as much as possible. Now comes the matter of a draft gauge. There should be installed in every power plant a draft gauge for measuring the difference in pressure between the atmosphere on the outside and the air on the inside of the furnace and stack. This gauge should be so installed that, by the turning of a cock or valve, the draft reading over the fire and also in the uptake or breeching can be obtained. The difference between the two readings will be about .008 to .01 per cent.

Air is composed of about seventy-seven per cent of nitrogen and twenty-three per cent oxygen. The oxygen is the only element that aids combustion, therefore, if one pound of air is admitted to the ashpit only about one fourth of that amount aids combustion, the remainder, or three-fourths of a pound which is nitrogen, being inert. Not only is the nitrogen of no aid to combustion but it is a source of loss, as it is heated to the same temperature as the oxygen and yet is not burned, but passes up the stack. For every pound of air admitted to the firebox in excess of the amount required, three-fourths of it takes heat from the coal. Thus we see that the regulation of the air supply is exceedingly important, if efficiency in coal burning is to be obtained. If the proper amount of air is admitted, the carbons and hydrocarbons are burned, giving off water in the form of steam and carbon dioxide—a gas. This, and other gases, the products of combustion, together with heated nitrogen and smoke, pass out thru the stack. It is said that to completely burn one pound of carbon (or coal) 11.6 lbs. of air are required. From this, 2.67 lbs. of oxygen are used in combustion and 8.93 lbs. of nitrogen pass up the stack without aiding combustion.

HOW TO MAKE CARBON DIOXIDE TEST

But, how are we to tell if there is an excess of draft? There is what is known as the CO_2 machine which takes a sample of the gas just as it leaves the boiler and by putting it thru a caustic potash solution, the per cent of CO_2 or carbon dioxide can be determined. For example, suppose six per cent of CO_2 is obtained with .4 of an inch draft over the fire. This would indicate that 245 per cent of excess air was being used, involving a preventable fuel loss of seventeen per cent. Suppose the damper is closed so that the draft gauge reading is .3 of an inch over the fire, and another sample of the gas is taken. This test shows nine per cent of CO_2 with 130 per cent of excess air and a preventable fuel loss of eight per cent. Now the damper is closed so that the reading is .22 of an inch, and still another test is made which results in fourteen per cent of CO_2 with 48.8 per cent excess air and a very small fuel loss.

There is no advantage in running a CO_2 machine over fourteen per cent because, if you do, you will simply burn up brickwork. With this machine gas analysis can be made every minute. I personally know of three plants that have installed a draft gauge and CO_2 machine that are saving from fifteen to twenty-five per cent in the actual cost of their coal. From this it can be readily seen how important it is to get the right amount of air with which to burn the coal.

An Improved Method for Thawing Dynamite.

It looks very much as tho the item appearing on page 247 of the February 1 issue of this magazine under the caption "'Safety First' in Thawing Dynamite" has started something which will prove of value to all concerned, if the first "come back" is to be taken as an indication of what might follow. A western reader takes exception to the method proposed in the above mentioned article for the safe thawing of explosives, stating that it is not only too dangerous but also somewhat antiquated. He offers in its stead the following:

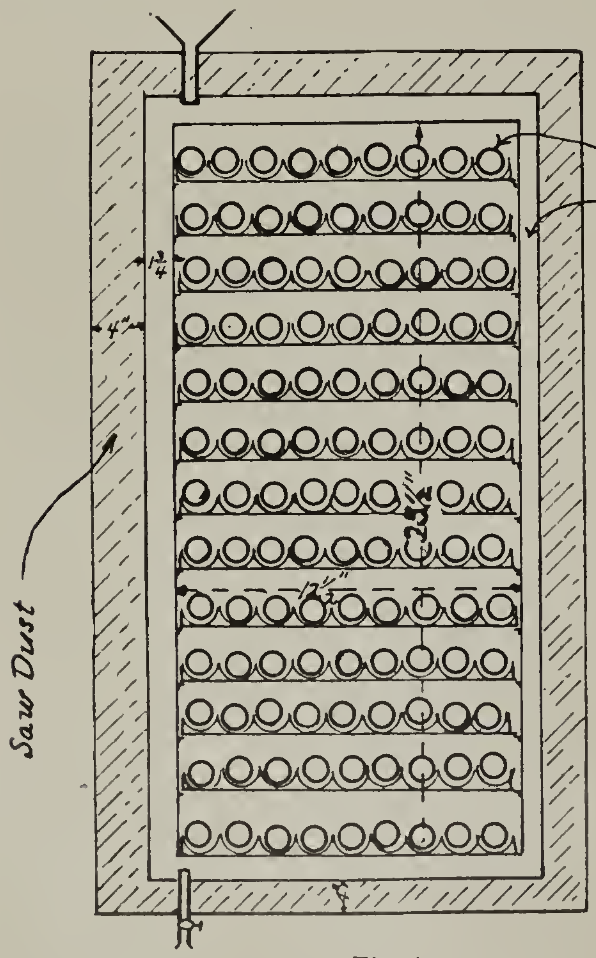

Fig. 1

"We enclose herewith drawing of the method used by our superintendent for thawing dynamite which is not only very safe, but has given satisfaction for fifteen years. These drawings show a galvanized-iron safe dynamite thawer, contained on the inside of a wooden box with an outer wooden door and an inner galvanized-iron door.

"In Fig. 1 you will note there is a 4-in. space containing sawdust and a 1¾-in. space between this and the dynamite, this space being filled with hot water. The water is left there until it becomes cool and is then drained out thru a stop-cock at the bottom of the device, a fresh supply of boiling water being poured in thru the funnel at the top.

"As you will note in Fig. 1, the dynamite is placed on galvanized iron semi-circular containers which are just large enough to hold one stick, allowing no play. Fig. 2 shows the exterior wooden box with the galvanized iron safe on the inside indicated by the dotted lines."

Electric vs. Steam Power

Many of the figures that are submitted by electrical experts, and which are supposed to demonstrate the economy of electric power over steam power, are misleading. They give the actual cost of electric power as delivered by the most modern and efficient apparatus, and compare it to steam power costs as shown by steam installations that are so out of date as to be almost obsolete.

Your present power cost, in case your steam power installation is of an old type, could be reduced if you were to bring that steam power equipment down to the minute, and it is unfair to yourself to allow your present cost to be used as a basis for figuring. Supply yourself with accurate estimates of what steam power would cost you if you were to replace your present boilers and engine with those of a more recent type. This sort of estimate would not cost anything, and would perhaps give you some very valuable information.

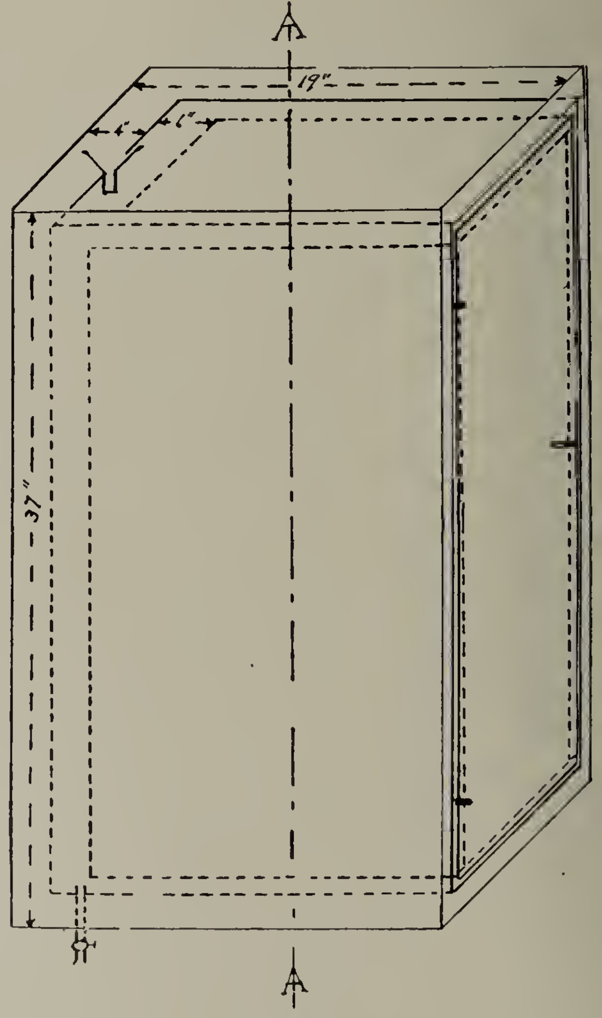

Fig. 2

QUESTIONS *and* ANSWERS

Here are Given the Replies Made
by America's Best Authorities to
Questions Asked by Our Readers

QUESTIONS sent to this Department will receive prompt attention, answers being returned by mail as soon as possible. Those that have wide interest will be published for the benefit of other clayworkers. The names and addresses of questioners will be held in confidence, and no letters will be forwarded them without first being scrutinized.

Eliminating Small Gravel in Clay

733. *West Virginia—We are bothered to know what is the best method to follow in getting rid of the small gravel in our clay. We are making an end-cut brick, using a ——— machine. Our first process is to drop this into a standard pattern clay disintegrator made by the same company. The clay drops onto a belt and is carried up and dropped into a pug-mill and from that we drop it into the brick machine. The gravel goes thru this disintegrator and often shows up just where the brick is cut or close to the outer walls of the brick. In burning, it causes a chipped place. We want to make our brick perfect and we do not want to have this checked place in them. For a number of years the machinery which we now have has been making brick that were good enough for the market but suddenly a competitor of ours begins to make a better brick than that which we have been producing and we have to either improve our brick or lose the business. We have been advised by some to use a dry-pan to better prepare our clay and by others to use a hammer crusher. We do not wish to put any more money than is necessary into additional equipment but we must make a better brick than that which we are now making.*

Small gravel is of common occurrence in many clays and its elimination is always difficult. There are many ways of doing away with a large proportion of it, but all of these require an investment. One method would be to put the clay thru a rotary drier and then crush the material in the dry-pan or a swing hammer crusher and then run it over a fine screen. This would make the gravel so fine that the small particles would not bother the burned material. By the use of a strongly reducing atmosphere in the kiln during the latter stages of the burn, the fine particles of lime are rendered still less dangerous.

Another method which is successfully used by an Ohio plant is to wash the clay in such a way that the clay particles are floated out. The gravel is thus separated in a very clean state and is shipped in carloads to a gravel company. The water that is used in the washing process and which contains considerable fine clay, is used for pugging the material. After washing, the clay is dried in a rotary drier and is practically ready for the pug-mill. The equipment necessary for this operation is rather elaborate, but this particular company is turning out material that will compete in price with any manufacturer's in the state of Ohio. Furthermore, the plant is making a good profit and is manufacturing both brick and hollow tile.

If the clay is one that can be put thru a heavy smooth roll crusher (one that can be set very close together) it may be possible to crush the gravel fine enough in this way to bring about the same effect that would be secured by drying and putting thru a pan. This at least would be a great improvement over the disintegrator, the latter being a machine that aids in no way in overcoming the difficulty. The smooth roll crusher would also be a cheap method.

Correct Construction of Scove Kilns

747. *Texas—What is the proper width and height for scove kilns, considering the fuel consumption and uniform burning? My fuel is wood. What is the best method of covering the top? How long should the burning be continued after the brick gets red on top of the kiln? I am making common-brick from surface clay.*

The width of a scove kiln in which wood is to be used is regulated by the distance that the wood can be thrown into the arch from each side of the kiln. A man can usually throw a 4-ft. stick of wood of medium weight about twelve feet back in the arch. The effect of the fling, of course, will reach possibly a foot or so more than this, according to the kind of wood that is used. The desirable width, under average conditions would, therefore, be from twenty-four feet to thirty feet. The usual height of the setting in this type of kiln is from thirty-five to thirty-six brick high. Sometimes it goes as high as forty brick, but it is easy to regulate this by what the clay will stand at the finishing temperatures. The best height for the arches is fourteen brick—that is, the arches are finished at the fourteenth course and the regular setting is carried on from that point. Using the arch as high as this saves many of the arch brick and rarely allows the arches to tumble.

The usual method of covering the top is to lay a platting course of burned brick flat over the top of the kiln, leaving draft spaces between the rows. The width of these draft spaces is determined by the kind of setting used and the speed at which the clay can be handled. These things must be determined by experiment.

Another platting course is laid so as to cover the draft spaces left in the first platting course. When the kiln is started these top brick are stood up on end and the draft is regulated by laying any number of them down over the draft spaces as may be required.

It is practically impossible to say how long the kiln should be fired after the fire appears at the top. Scove kilns are generally burned by settle measurements. In the beginning with a new clay it is necessary to burn a kiln until, in the burner's judgment, it is hard enough thruout. An accurate settle record of this burn is kept and if this kiln is not hard enough the next one will be burned with slightly more settle and this method con-

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tinued until the proper settle is found. After that no difficulty should be encountered in getting practically all kilns to come in alike.

Ground Moisture and Soft Bottoms

737. *Alabama—We are burning our brick in up-draft kilns and we find that all of the brick that are set on the bottom are ruined and useless, this condition being caused by the moisture arising. Our kilns now have a good tight brick floor in them and it seems that it does not stop the rising of the moisture one bit. We contemplate making a floor of concrete and would be glad to know what has been the experience of others who have had the above mentioned trouble and what has been done to remedy the defect.*

Your trouble undoubtedly comes from your having built the kilns on wet ground and the solution is found in draining the ground upon which the kiln stands. Providing that there is fall enough from the kiln ground to some outlet that will carry the water away, the process of draining should not be difficult. Of course, if you cannot get fall enough to take the water away naturally, the drains could be run into a sump from which the water could be occasionally pumped out by hand or by use of a steam pump.

The drain tile should be placed not less than six feet under the floor and if the ground be quite damp, these tile should be not less than eighteen inches apart. A drainage system of this kind should give perfect satisfaction without the necessity of building a concrete floor for the kiln.

A concrete floor might help to some extent altho it will not entirely overcome the difficulty. A slab of concrete so large as this would be, would very quickly crack under the heat and weight to which it would be subjected and the water vapor would be drawn thru these cracks into the kiln. Building a concrete floor also would be much more expensive than laying the drainage system that we have suggested.

You state that you now have a good tight brick floor and this being the case, it would appear as tho there must be a considerable amount of water under the kilns or you would not be ruining the bottom courses of your setting.

All of this points to the necessity of drainage. If there be so much water as the conditions indicate, then there is no cure in sight but the one which is found in getting rid of that water. Trying to hold the water back has been unsuccessful in practically every case where it has been tried, even tho large amounts of money have been spent in this direction.

Comparative Productions—Brick vs. Hollow Tile

748. *Minnesota—We are anxious to secure some information which we can use to guide us in our decision as to whether or not it will be profitable for us to change over a part of our production (or all of it) from building brick to hollow-tile. What is the hollow-tile "equivalent" of common-brick—that is, how many hollow-tile should a plant produce which is at present producing 50,000 common-brick per day? What is the average cost of hollow-tile production? Can you give us these figures based on a per thousand production in hollow-tile and thus enable us to compare it with the per thousand brick production cost?*

A plant which has a machine, drier and kiln capacity for 50,000 common-brick per day should turn out from

15,000 to 18,000 5-in. by 8-in. by 12-in. tile per day, providing of course that the clay is not exceptionally difficult to handle when made into hollow-tile. Hollow-ware manufacturers generally refer to their tile on the tonnage basis; a 5-in. by 8-in. by 12-in. tile weighs about 15 lbs.—that is, the average tile made in this country with ¾-in. webs and walls weighs about that. This would make about 133 to the ton. One thousand 5-in. by 8-in. by 12-in. tile equal in the wall about five thousand standard size common-brick.

The average cost of making 5-in. by 8-in. by 12-in. tile in this country is about $15 per M. or perhaps more. It is, however, manufactured in some plants which are exceptionally well managed, for about $10 per M. Both figures are given for the reason that the manufacturing cost on the large plants is very much lower than the cost on the plants where both brick and tile are made and where the production is naturally small.

ILLINOIS CLAYWORKERS STAGE MIRACLE PLAY

(Continued from page 337)

Illinois clays. R. R. Danielson, B. S. (in Cer.), also of Illinois University, read a very interesting paper on stoneware, urging the use of Illinois deposits for this purpose. He showed several very fine examples of ware made from Illinois clays, with simple glazes.

An informal talk by J. Otto Trautwein brought out some interesting facts regarding the comparatively large amount of burned clay materials which could be produced in Illinois, and with Illinois clays, but which were either not being made, or were made in such small quantities, as to make it necessary for Chicago—the largest market for burned clay structural materials in the world—to bring in immense quantities of burned clay ware from very distant points. He opened the subject of cost-accounting and was made a member of the committee on uniform cost system.

HUCKIN'S "MIRACLE PLAY"

The stage was set for a regular "gol-ding-it" stag. Tables with pipes (clay) and real smoking tobacco from which the sting had not been expurgated, promised a "bang-up" time. The red curtain added to the effect.

Someone sang a song or two and someone played ragtime. Then the gifted Huckins announced his "morality" play and urged the necessity of watching the calendar.

When the curtain was drawn, it disclosed the office of a manufacturer of face-brick, who shortly after received a visit from an architect who was accompanied by a woman client. As a result of the clever salesmanship of this brick man, the owner and architect chose one of his best colors, and in a new texture. Incidentally, a very satisfactory price was mentioned and accepted.

Then came the orders to the yard to "stock up" on that shade, and in the next "scene" (the same office, with a later date on the calendar) the contractor came in, and, by representing a change of heart on the part of the owner, he succeeded in getting a reduced price. Still later, this contractor was found to be untruthful. The despairing brick man asked a competitor if there was any machine one could get, which would tell when a man was lying, and was told that there was—that the competitor had married one.

The "play" went on, until, in the last act, the brick man's office was found equipped with a black-board and stock-ticker, and "quotations" on brick being recorded with as much promptness and reliability as are the quotations of "war-brides" in a stock and bond office.

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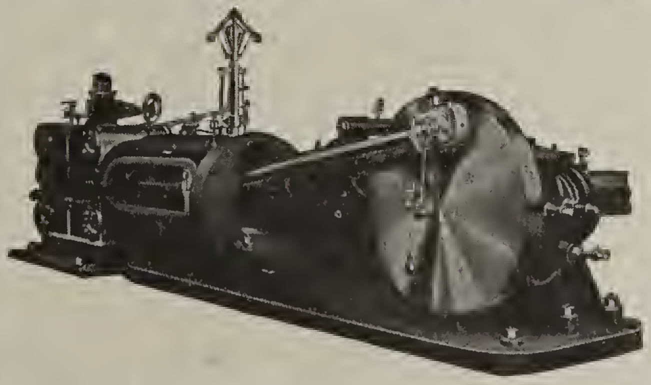

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The LETTER BOX

A Place Wherein Letters
That Have General Interest Are Published and
Commented Upon

A Protest from Robert L. Queisser

In the December 21 issue of "Brick and Clay Record" was published a report on the annual convention of the Face Brick Dealers' Association of America. It was as follows:

"With its president absent, and its secretary trying to fill his own position, and at the same time preside at meetings and control debate, the Face Brick Dealers' Association of America started another year of its not altogether productive career.

"The annual convention, held at the same time and place as that of the American Face Brick Association, brought the selling end of the face-brick business close to the manufacturing end, and some good was done in this way to the membership of both organizations.

"Archie E. Reid, of Newark, N. J., and Philadelphia, Pa., was elected president, to succeed F. Lawson Moores, of Cincinnati, Ohio."

Under date of January 28, Robert L. Queisser, secretary of the Face Brick Dealers' Association of America, writes us as follows:

At the meeting of the Executive Committee of our Association just held at Detroit, Mr. Reid, President, called the writer's attention to a paragraph on page 907 of your December 21st issue.

The article may have been written in the spirit of levity, nevertheless, it is so absolutely untrue and malicious that I cannot well let it pass without at least registering a decided objection. That any paper, even tho remotely connected with so large an industry as the brick business, would endeavor to put a slight upon an organization that has really accomplished for its members what our association has done, passes understanding.

Perhaps we are not as free as some others in "blowing our own horn," but it is a significant fact that our association is steadily growing, that our members apparently are satisfied that something is being accomplished, and nearly all of them are doing a good deal to promote its welfare.

The Face Brick Dealers' Association is today the largest of its kind, we believe, that ever has been organized, and it is rather unfortunate, it seems to us, that a paper that is supposed to stand for the best interests of the clay industry, should endeavor, in an article such as is above refered to, to pull down rather than to help association work. In other words, a *good trade paper* is supposed to be constructive and not destructive.

It was most unfortunate, of course, that our President, Mr. F. Lawson Moores, of Cincinnati, than whom there is no better known or more prosperous dealer in the middle states, should, on account of sickness, have found it necessary to go to California, and not be able to be with us, without being, by inuendo, attacked for his absence at an annual meeting.

So far as "the secretary trying to fill his own position" is concerned, I have nothing to say, because *his friends* in the business know all about him, and for what others think he does not care. His record and business standing speak for itself.

The further reference to "Archie E. Reid" is another indication of the animus of the article. Mr. A. S. Reid, president of two of the largest companies in the east, one at Philadelphia and one at Newark, deserves at least the courtesy of decent treatment by your paper, irrespective of what spleen your correspondent may be laboring under.

It may be further news to you altho your correspondent on the ground does not seem to have grasped the situation) that both Mr. Clay Herrick, of Cleveland, who presented a wonderful paper on "Costs" at the joint meeting, and Mr. D. M. Barrett, of Detroit, editor of *Salesmanship*, who spoke on "The Salesman, the Man of the Hour," and whose papers were features of the convention, both represented the Dealers' Association.

While, as a rule, we ought to pass by without comment, an article such as we find in your December paper, yet, in view of the fact that our association both stands for something and has accomplished things, the writer feels that it is no more than justice to our association that he should put before your editors the true state of affairs, which apparently have been badly garbled, either thru ignorance or willful maliciousness.

"Brick and Clay Record" wishes to disclaim any spirit of levity or of maliciousness in connection with the convention notice to which Mr. Queisser takes exception. Its ordinary channels having failed to disclose any particularly constructive work done at the conventions—or between conventions—of the association, it assumed that little if anything had been, or was being done. In this it erred—yet the error is forgivable, since experience with other associations has taught that publicity given to achievement was generally sought, rather than avoided.

So it is with the feeling that an error has been committed that we print Mr. Queisser's letter, and at the same time hope that, having administered a good drubbing, he will take us back into his good graces. We will be glad, indeed, to print what he may be willing to send us of the plans—the accomplishments—the hopes and aims of the association he so ably serves.

Mr. Queisser has raised one point, however, that we regret. In our account of that meeting, we misprinted Mr. Reid's middle initial. To the writer of the article, Mr. Reid is "Archie," just as he is to hundreds of other face-brick men, all of whom have known him well and respected him, his work, his sunny disposition and all of the other characteristics that have won to him a host of friends—for more than twentv years.

Above all, "Brick and Clay Record," in its aim to be a "good" trade paper, aims to be constructive. It hopes that the net result of this published correspondence will act toward that end.

Starting to Make Hollow Clay Block

The hollow clay block is making itself felt in many parts of the country, and just as in Iowa it is the farmer who asks for the "big brick with holes thru it," so in the South it is the tiller of the soil who is making the clayworker give serious consideration to hollow-ware. From Morganfield, Ky., comes the following letter, signed by Fred W. Alhorn:

> We are thinking of manufacturing hollow-block in connection with our other clay products, and are writing to ask you if you can put us in touch with some plant which makes this ware, and which sells it mostly to farmers for building silos, barns, granaries and other outbuildings.
>
> And do you print any book which gives pictures of such houses, and plans for them? I have often thought that if the manufacturers of burned clay hollow-block and brick could get a small booklet that would show the various uses of these materials on the farm, that could be put in the hands of farmers, it would create a demand for brick and hollow-tile, right where the demand now is all in the direction of lumber and cement.
>
> I understand that hollow-block are now being extensively used in some of the western states for farm buildings of all kinds and will thank you for any information you can give me on the subject.

"Brick and Clay Record" has already prepared one booklet, which treats of the hollow clay tile silo. This has twenty-four pages and paper cover, is illustrated, and sells for 5c a copy, in hundred lots. Where larger quantities are bought,

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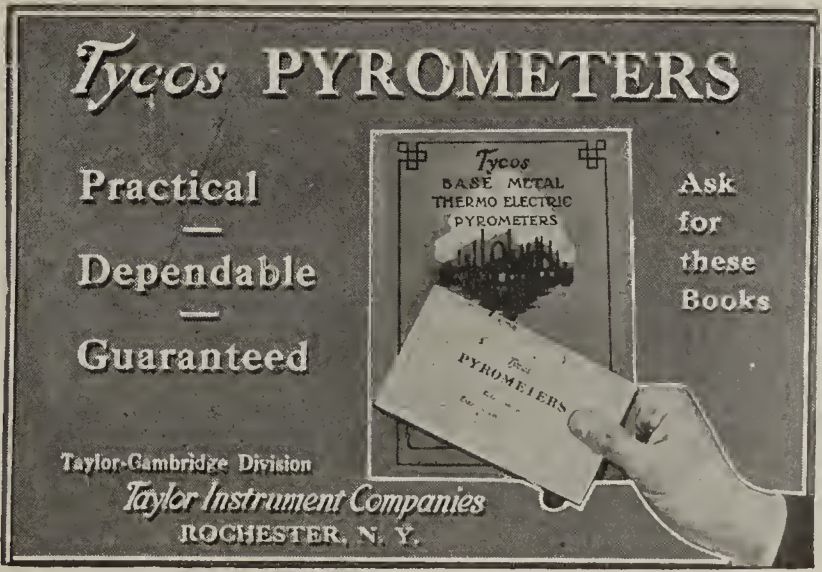
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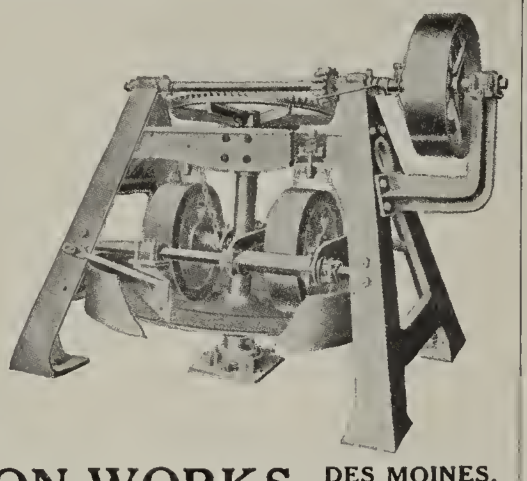

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For dipper load—
Swings back—then dumps—
and the chains—"They will not break"
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a lower price is made. Similar booklets are in preparation. One will treat of clay drain-tile and one on the brick silo. After that will come farm buildings of hollow-tile. Some will include small scale plans.

There are a number of clayworking plants in Iowa, making hollow-tile and silo block and drain tile—plants which sell practically all of their output to farmers. Homer F. Staley, newly elected secretary of the Iowa State Clay Products Manufacturers' Association, Ames, Iowa, will give you the names of several plants, if you will write him, telling just what information you wish to secure.

We sincerely hope that you are reading the Greaves-Walker articles on hollow-ware dies. These articles were begun in the January 18 issue of "Brick and Clay Record" and are worth a lot of money to the man who is just starting to think of making hollow-ware.

The Advantages of Oil Fuel

Manufacturers of clay products will be interested in the statements made by A. J. Backley, who writes from Neoga, Ill., and gives some facts about oil fuel:

I believe that some of your readers do not know the many advantages that come of using oil in burning of brick and other clay wares. The uniform heat from start to finish is one of the most essential things; in burning oil you have the heat under complete control, which gives the burner more of a chance to keep all parts of the kiln at a uniform temperature. The absence of soot and smoke in the kiln also helps the burner to see and know how the kiln is doing when it is on fire. The space which coal takes around the kilns can be used for other purposes. There is no need of clinkering when using oil, no fire grates are needed, one-half of the length of the smoke stack can be dispensed with and the goods can be burned in one-half of the time that it takes when coal is used.

The quality of the goods burned with oil is much better than the quality of those burned with coal. Two kiln men can keep the fires going in ten down-draft kilns, each of these kilns having ten fire-boxes. I have done this myself in different yards and I know of one yard where they use oil in burning five up-draft kilns, containing 300,000 brick each in eleven days. The one kiln was burned in twenty-four hours. Two and a half barrels of crude oil will do as well and sometimes a little better than a ton of the best black coal. I do not know how many men it would take to deliver the fuel to ten down-draft kilns of ten fire-boxes each as I have never burned with anything but oil, but I have burned all classes of material that are made of clay, from the finest down to the poor old "doby" brick and I do not recall that there were any failures charged up to me. Oil at 80c per barrel of forty-two gallons will do more work than coal at $2 or $2.50 per ton. I am planning to go to Kansas, Oklahoma and Texas in the near future; do you know of the conditions in those states? Is the clay industry prosperous and are any new plants being started? If it is convenient for you to give me this information, it will be thankfully received.

It may be that brickmakers or other workers in clay whose plants are located in Kansas, Oklahoma and Texas will be good enough to write Mr. Backley, telling him of the conditions of the industry as they know them.

Making Two Tile at the Cost of One

The following letter, that comes from E. Finch, Box 28, Huntsburg, Ohio, has some good points in it. It will certainly repay a careful reading:

I was president and general manager of the South Park (Ohio) Sewer Pipe and Drain Tile Company, and ran it for five years. During that time, I cut down the weight of all the tile made there, to one-half of their original weight, and found that they gave much better satisfaction. There was less freight to be paid, less expense for hauling, and much easier handling for the farmers.

I cut the weight of the 3 in. from 8 lbs. to 4 lbs. each and all of the other sizes in the same proportion, and burned them all hard enough to stand the weather and the weight that was placed upon them by the soil in which they were laid.

Our trade doubled itself each year, and I was able to meet this demand by the shorter burning period which came as a result of the reduction in the thickness of the tile. We also burned our 3 in. tile in our 4 in., which gave us two kilns for one, with the same amount of fuel and labor burning.

I wish you would make mention of this in "Brick and Clay Record" or publish this letter for the benefit of your readers. They will find that it will be a great saving to them in the cost of digging and handling the clay, as well as in the cost of burning. It makes two tile with the same amount of clay and coal and labor as it would take under the old way of making one tile.

If any of my brother tilemakers care to write me and get more advice on the subject, I will be very glad to answer them and show them how they can cut their costs in half.

The tile plant at South Park, Ohio was bought by Philip Smith and his wife, and will be run by them—not under the company's name, but as, I understand, the Smith Tile Works. They are figuring on delivering the tile with an electric truck and on putting in an electric 60 h. p. motor to run the plant.

"Brick and Clay Record" advises its readers who are interested in the manufacture of drain tile, to write Mr. Finch, who seems to have some good ideas on plant economy.

Relative Costs of Roofing Materials

In a recent issue of this magazine there appeared a story—"The House of Happiness." Among the cost items of the very beautiful and, at the same time, low-cost bungalow described, was that of roofing—and asbestos shingles were mentioned. Leon Goodman, vice-president and general manager of the Des Moines (Iowa) Clay Company, wrote, asking why "Brick and Clay Record" was giving so much prominence to a material which was neither burned clay, nor as good as burned clay.

There had been so much said and written about the excessive cost of burned clay tile, that we asked Mr. Goodman for some figures. He gives them in his letter of February 9:

It is very hard for us to give you definite figures on clay roofing tile, as fittings and cut work enter into it to quite an extent; also the question of whether the tile is to be a red burned or a glazed tile.

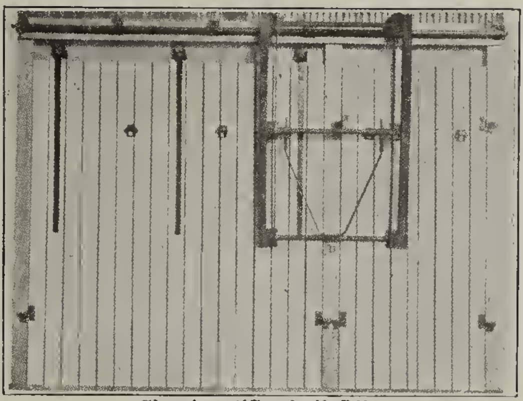
As far as the structure is concerned, you can readily see that it would require very little additional strength. Roughly speaking, we would say that you would assume a live load on the roof of 40 to 50 pounds. Your substructure, so far as dead load is concerned, would run about 10 pounds, making the total (without the roofing material) from 50 to 60 pounds. Assuming your shingles would weigh a pound and the roofing tile 10 pounds, it would add from 15 to 18% and not increase the loads 600 or 800% as is commonly supposed. Another feature in question is the safety factor. You will realize that not less than a 2½-inch rafter should be used, so that you would again decrease the actual percent added by the use of burned clay roofing tile.

Of course, it would require some little additional strength, but you, no doubt, can see that this would be but a very small item.

From an engineering standpoint I am inclined to believe that there would be more difference in the quality of the timber used and in the workmanship in placing it, so that it will have its full bearing and can develop its full strength, than there is due to the additional weight of the tile.

The clay tile itself is not expensive, but where a roof is badly cut up and requires a great deal of fittings and special pieces, the cost does run up quite a bit. In this section, the cheapest asbestos roofs, such as the large blocks, are considerably cheaper than roofing tile, but the best grades of asbestos cost as much or more than clay tile. The asbestos shingle has one attribute and only one, and that is, it is fire-proof, while there are four attributes, each one of them of enough merit to warrant clay roofing tile on practically any residence, other than the smallest type.

These attributes as I view them are: safety, from the



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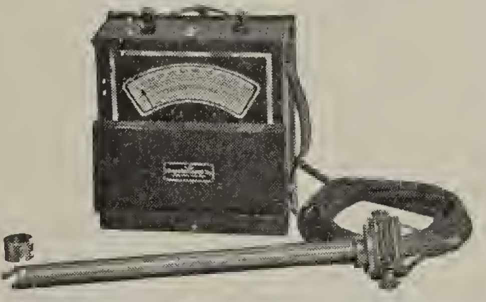

PYROMETERS

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CARBONDALE, PENNA.

PERFORATED METAL SCREENS

As required for BRICK MAKERS USES.

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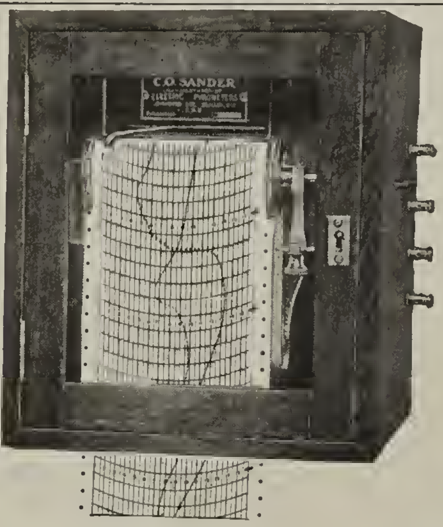

Guesswork—Knowledge

Guesswork means poorly burned ware, with a corresponding big waste.

Knowledge of your kiln temperature (gained thru the use of the pyrometer) means absolute heat control, uniformity in burning—waste cut to a minimum. Let us help you make the wise choice.

The Sander Instrument Co.
136 19th Ave., Irvington, N. J.

DO YOU WANT An Employee? A Position? To Buy Anything?

HAVE YOU For Sale Used Machinery? Land, Plant, or Anything Else?

"Brick and Clay Record" ADVERTISEMENTS Bring Returns.

Flower Pots—A Profitable Bi-Product

No matter what the nature of your clayworking plant, it is no doubt possible for you to add Flower Pot manufacturing with very little additional outlay.

Often you wish you had some way to keep Jim Smith or Jack Jones busy all the time, don't you? Well, here's the solution: put in a

Baird Flower Pot Machine

Easy to operate, absolutely accurate. Makes any regular size pot desired.

Send us a sample of your clay and let us show you what our machine will do.

Baird Machine & Mfg. Co.
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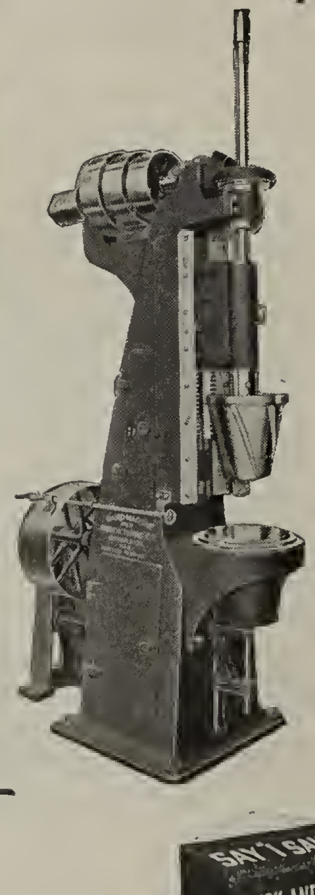


fire standpoint, artistic value, durability and economy—the latter in that the first cost is the last cost and the elimination of expensive and constant repairs.

Again referring to the subject of the cost of the material itself. This, as I have said, varies so much that it is hard to give definite figures; also the cost of incidental material used affects the total cost; that is, whether the felt used underneath the tile is a good grade of asphalt felt or a cheap paper; the quality of the nails, as to whether they are galvanized, which will rust out, or copper; Portland cement for imbedding fittings, against elastic cement. You can easily see how these will affect the cost. The labor of putting the tile on is necessarily controlled by the roof itself, whether it is a plain, simple roof on which a man can go ahead without interruption and lay a great deal of tile, or whether it is all cut up, in which case most of his time is spent on fittings, getting his valleys and hips fitted, etc.

However, in this section roofing tile in place will vary from $10 to $15 per square in red and about $5 more per square for the green.

One angle that should enter into every residence, and which if it did enter would show tile more favorably, is that of the simple principle of the value of money. Money is worth so much because it is capable of earning so much. If, with this in mind, one will go into the insurance problems and find the saving in this item, he will find the amount actually exceeds the value of money invested for roofing tile.

Then again the problem of the market value of the residence which everyone will agree is greatly increased by tile. I do not believe that there is one person out of a thousand, if he is going to buy a home that is already built, but what would be so favorably impressed by the added appearance due to tile, that this extra amount invested would not be a consideration.

I have written you a more lengthy letter than I intended, but I did want to answer your questions as nearly as possible, inasmuch as it is not possible for me to prepare an article that would definitely give what you seem to want.

Would be very glad to give you any other information that you desire, if it is possible.

There is no denying the fact that a popular superstition exists, which militates against the use of burned clay roofing tile. This is the evidently mistaken idea that to use burned clay tile would add so much to the cost of a small house as to make that house expensive.

For that reason, many men advocating the better building of low cost homes, have advocated shingles that would answer to the name fire-safe, and yet be (in their opinion) much less expensive than burned clay tile.

It must be remembered that these men who advocate fire-safe homes recommend brick and hollow-tile because they are the least expensive non-burnable building mateial. They are distinctly *not* recommended because they are brick or are hollow-tile.

If burned clay roofing tile answers that same description—is the lowest cost non-burnable material (and in this must enter the maintenance figures) then these men who are specifying asbestos shingles are wrong, and letters such as that written by Mr. Goodman should be brought to their attention.

More Light on "Oriental" Brick

Harry C. Podolsky, general manager of the Bonner and Marshall Brick Company of Chicago, goes on record as one of those qualified to speak on the subject "Who Made the First Rough Face Brick?" He writes under date of February 7:

I have read, with considerable interest, the letter written by Mr. I. G. Poston, and published in your "Letter Box" in the January 18 issue of "Brick and Clay Record." While it is not my intention to enter into a controversy on the subject, I would appreciate your publishing the following, which cites the facts as they really exist:

According to my knowledge of the subject (and I do

not believe that my statements can be questioned) the "Oriental" brick, manufactured at Crawfordsville, Ind., by the Poston Paving Brick Company—a concern whose product is exclusively controlled by the Bonner and Marshall Brick Company of Chicago—were the first brick with wire-cut faces that were used in building construction, at least west of the Ohio river.

The idea and the process of manufacture were originated and perfected by William Hendrix and B. J. Gallagher, while they were in the employ of the Poston Paving Brick Company of Crawfordsville. In October, 1904, samples of these brick, with one face wire-cut, were sent to the Bonner and Marshall Company, in Chicago, and it was at the suggestion of this company that at least one end be wire-cut, as well as the face.

In December, 1904, samples were received in Chicago that were wire-cut on one face and one end, and in January, 1905, samples that had one face and both ends wire-cut. The following month (February, 1905) "Oriental" brick, identical with those that we are selling today, with both ends and both faces wire-cut, were received by us. Before the end of that year we were shipping "Oriental" brick from coast to coast and into Canada.

Among the earlier and important shipments were those made for the Springfield (Mass.) Institution of Savings, the Sweeney residence on North Meridian Street, Indianapolis, Ind., and the famous John R. McLean residence in Washington, D. C., which Mr. I. G. Poston mentioned in his letter. It is interesting to note that numerous buildings have been served with this brick, where the freight alone has run above $25 per thousand brick—more than $300 a carload.

I believe Mr. Poston's letter misleading, and deem it a duty to take exception to his statements and to acquaint those who are interested with what I have reason to know are actual and undeniable facts.

Still the question is not settled; who made, who sold and who used the first wire-cut face face-brick? Here we have figures bringing the manufacture and shipment back more than eleven years.

Hollow Tile in Detroit's Building Code

Article 9 of the Building Code of Detroit has been amended to read as follows:

Sec. 3. *Tile.* All tile for floor or wall or for fireproofing purposes shall be made of pure clay, well burned, free from undue warping and cracks, with webs and flanges not less than five-eighths (⅝) of an inch thick and with rounded fillets at all intersections, provided that webs less than five-eighths (⅝) inch thick may be used if the vertical height is less than five (5) times the least width, but such webs may not be assumed to transmit pressure to a mortar bed. No tile shall be used which absorbs more than twelve (12) per cent of its weight of water fully immersed.

Tile shall be known as either hard, ordinary or soft. Hard tile shall have a crushing strength of not less than two thousand seven hundred and fifty (2,750) pounds per square inch of net section when tested with the cells vertical and not less than two thousand (2,000) pounds per square inch of net section with cells horizontal. Ordinary tile shall have a crushing strength of not less than one thousand seven hundred and fifty (1,750) pounds per square inch of net section with cells vertical and one thousand (1,000) pounds per square inch with cells horizontal and shall have not more than sixty (60%) per cent hollow space. All other tile shall be considered soft and shall not be used in bearing walls.

Where concentrated loads bear on hollow tile walls, the wall shall be made solid at the top by use of brick or by filling the voids in the tile with concrete for a space not less than six (6) inches deep and four (4) inches wide for every ton of concentrated load. This solid bearing shall extend the width of at least one tile and shall not be less

Used by Thirty-Seven Different Plants

Grateless Gravity Feed Fireboxes

are being installed today on the plant of the Sioux City (Ia.) Brick & Tile Co., manufacturing face brick, common brick and hollow ware; also at the Flint Brick Co., of Des Moines, Iowa, who manufacture paving brick.

Here is what one user says:

"About two years ago I settled a lawsuit with my neighbor for smoke nuisance, by installing the Grateless Gravity Feed Firebox, which has done away with the smoke in a satisfactory way for my neighbor, and also has been a business proposition for me in saving fuel and burning better ware, and in general has been most satisfactory in every way."

Send at once for our pamphlet

GRATELESS FURNACE COMPANY
FUEL ECONOMISTS AND ENGINEERS
DES MOINES IOWA

BALDWIN

You want a reliable, economical locomotive for service about your plant. Investigate the **Baldwin gasoline locomotive.**

These locomotives are reliable, because they are correctly designed and built. They are economical, because they consume no fuel while standing idle.

Record No. 74, which is yours for the asking, tells all about them.

THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA, PA., U. S. A.

The Double Crown Saves—

A second crown is built over the kiln, a current of air is blown between the crowns and down into the fireboxes.

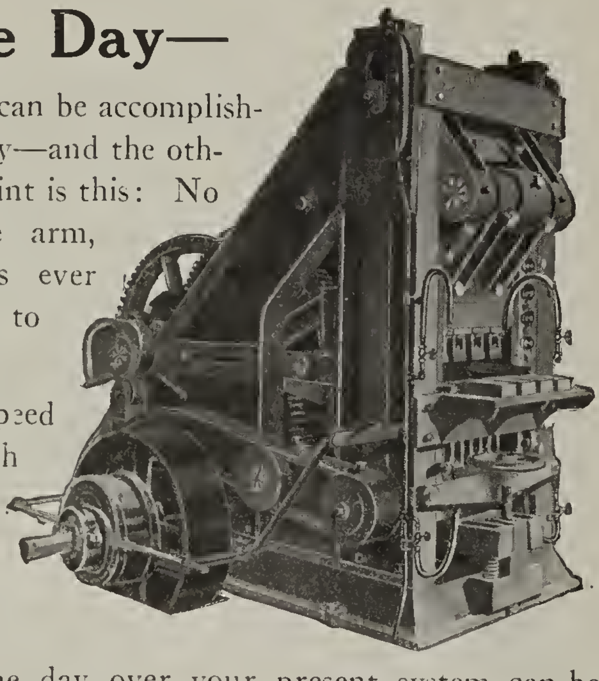
It preserves the inner brick work, and also provides a method of collecting the enormous amount of radiated heat and utilizing it.

Practically a perfect control of the fires is obtained, and a great saving in fuel and time accomplished.

The McManigal Grateless Furnace Co.
LOGAN, OHIO

3400 DRY PRESS BRICK

In One Day—



That record can be accomplished consistently—and the other wonder point is this: No gear, pressure arm, or frame has ever been known to break.

It has high speed combined with great strength and efficiency.

The extra brick that can be made in one day, over your present system can be made with practically the same power and labor. The extra is your velvet.

SEND FOR INFORMATION NOW.

Illinois Supply & Construction Co.
Century Bldg. St. Louis, Mo.

than two (2) inches thick and eight (8) inches wide in any case.

Section 8 of Article 10 of the same code has been amended as follows:

Sec. 8. *Hollow Tile.* Hollow tile meeting the requirements of Article IX, Section 3, may be used in construction of bearing, enclosing and partition walls under the following conditions:

(a) The thickness of wall shall not be less than given in Article XVI, Section 2.

(b) The working stress shall not be greater than that given in Section 5 of this article.

(c) Hard tile may be used in buildings not to exceed two (2) stories in height, above the first floor level.

(d) All tile shall be laid in mortar not inferior to that specified in Section 5, of this Article. All tile shall be thoroly bonded, one to another, both vertically and longitudinally, joints staggered and filled with mortar. No broken tile will be allowed. The vertical webs of one shall be set directly over the vertical webs of the adjacent tile below, except when laid as in Section E. The stress shall not exceed one hundred sixty-seven (167) pounds per square inch of net section with cells vertical. Only the webs in vertical alignment with the webs above and below will be assumed to carry load. No cutting of blocks will be allowed to admit pipes in bearing walls unless two webs remain unattached or filled in solid with concrete. The metal fabric hereinbefore specified may be omitted in non-bearing or curtain walls with voids horizontal.

(e) Tile walls faced with brick shall have a header course every eighth course, but not to exceed twenty-four (24) inches, otherwise, the brick facing shall not be regarded as part of the wall.

(f) In calculating stress, only these vertical webs in vertical alignment with vertical webs below may be considered as carrying load.

The ordinance will take effect sixty days from December 14 last.

"Pave with Brick" Poster Stamps

The "posterette" or, as it is sometimes known, the "poster stamp" has attained the dignity of an official organ. A small magazine, published in Yonkers, N. Y., and known as the "Poster Stamp Bulletin," is issued each month and contains, as a rule, several specimens of the latest products of the color printer and the lithographer, as these products take the form of posterettes. In the October, 1915, issue of the "Poster Stamp Bulletin" appeared an article accompanied by the illustration of "Brick and Clay Record's" paving brick stamp and with it the following:

"A trade paper published in the interest of manufacturers of brick and other clay products, favors us with a pair of fine poster stamps such as they furnish to the trade at $1.50 per thousand, for general publicity. Their office is 445 Plymouth Court, Chicago, and one of the pair, in sober black and white, is illustrated herewith; the other we are saving until next month.

"No, Percy, you do not have to write them for samples or buy a thousand to get a set for your album, as 'Brick and Clay Record' kindly sent our exchange department enough to pass around to our members upon receipt, when that request is accompanied by a red stamp. If you would like more than one set, send along something for the exchange department and we will oblige as long as our supply lasts."

Manufacturers of paving brick who have not, as yet, seen the splendid amount of advertisement which is given their product by a generous use of these little brightly colored stamps, should awaken to the possibilities. Here is an instance of an organization publishing its own booklet, reaching men and women in many cities. True, they are collecting poster stamps as a fad. At the same time, each of them lives in a house and in front of that house there is a road or street. A time may come, and soon, when some paving proposition will be brought up in connection with that particular street and this householder will already have been at least partially "sold" upon the brick proposition.

What one small society is doing along this line should be duplicated and multiplied by those who are interested in the material of which this "posterette" talks. Every piece of mail matter that leaves the office of a paving brick concern should bear a "Pave with Brick" stamp. The cost is very small but the advertising is very big.

Who Are Your Congressmen?

An answer to this question may be found in a unique pamphlet just issued by the American Protective Tariff League entitled "Roster of the Sixty-fourth Congress," which will be found useful to every person who wishes to communicate with any member of congress.

The Semi-Monthly Trade Review

NATIONAL BUILDING STATISTICS for January, when completed, will probably show a gain in estimated value of at least forty-nine per cent over January, 1915, predicts the "Journal of Commerce," New York. The demand for building materials, as reported in eighteen of the most important cities, is in excess of the 1915 January movement. The tonnage of these materials moving on railroads was 31.5 per cent over that reported for January of last year up to the 25th.

Among the commodities on the New York market that reflect the improvement in prospective building, common-brick holds a prominent place. From January 1 to 28, 1915, there was sold 8,400,000 common-brick from the wholesale Hudson River market. In the same period this year 20,650,000 brick were sold. One year ago the price was $5.75 to $6.25 per thousand. During January of this year, the price has been $8.50 to $9.50, with one transaction involving a price of $10 a thousand. One year ago the plan filings for the four weeks in January totaled 526 new buildings costing $11,616,184. This year January shows 979 new buildings projected at a cost of $9,665,421, showing a great improvement in volume and a falling off in value. The gain in value last year was accredited to two one-million-dollar operations in Manhattan. The remarkable

HETTRICK
Red Stitched Canvas
BELTING

THE HETTRICK BELTING
HETTRICK CANVAS BELTING BEATS THEM ALL

Conveying—Transmission
Elevating Belts

It is very probable that you are using each type of belt. Are you having trouble? Are they giving service?

On a poor belt, the edges ravel, the plies come loose, the material shrinks and stretches, it needs to be cut often—in short it is a big money loss.

Can You Afford It?

Hettrick Belts are designed and built; they must come up to specifications or they are rejected **in the factory**, and **you** get belt service.

The clay plants that are hard to sell to—are using Hettrick beltings. It is Quality stuff.

Hettrick Bros. Co.
Toledo, Ohio

You won't have to worry about competition if you treat your clay with

R. H. Precipitated
Carbonate of Barytes

You can safely guarantee that your brick will be

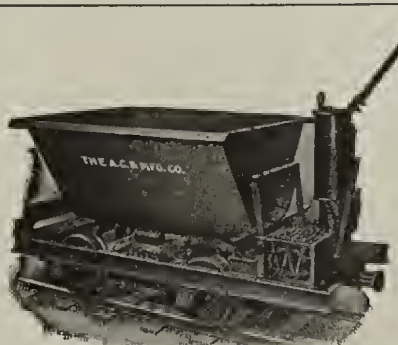
Scum-Proof

You can get a higher price and influence architects to specify your product because Efflorescence is prevented absolutely.

But insist on the R. H. BRAND—it's dependable.

We have a complete line of high grade chemicals for the clay industry.

The Roessler & Hasslacher
Chemical Company
100 William Street New York
Chicago, Ill. Kansas City, Mo.
East Liverpool, O. Philadelphia, Pa. New Orleans, La.
St. Louis, Mo. Boston, Mass.



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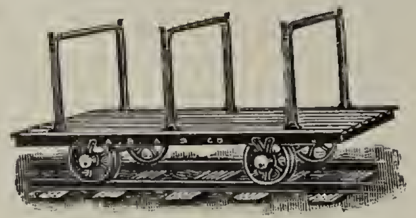
By the Purchase of Efficient Equipment

No. 217-E. Side Dump Car Equipped with Motor



No. 126 Double Deck Dryer Car

ATLAS
High Efficiency
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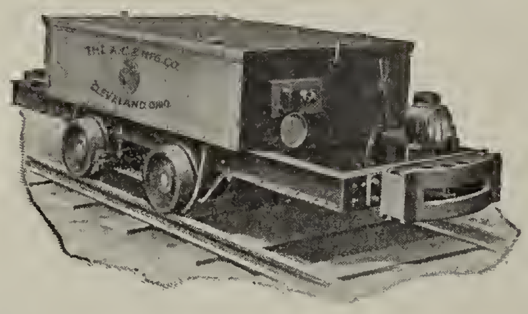

Storage Battery Locomotive for general use.

will meet your requirements. Let us send you catalogue and quote prices.

THE ATLAS CAR & MFG. CO.
1287 Marquette Road, Cleveland, Ohio

HOW TO ANALYZE CLAY

A Practical Work
for Practical Men

An aid to beginners and full instructions for making clay analysis

64 Pages with Illustrations
By HOLDEN M. ASHBY

PRICE
$1.00
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"BRICK AND CLAY RECORD"

gain in volume, however, for January of this year shows how widespread is the present building movement.

Two large hotel enterprises in New York—one a thousand room building to be erected near the New York Central Terminal—give some idea of the market for vitrified sanitary tile, alone, these two establishments having 1,600 bathrooms.

The faience market is also showing strength. According to Emil Kohler, secretary and treasurer of the American Encaustic Tiling Company, New York, 1916 will see the biggest movement in this material the American trade has ever known. Mr. Kohler says:

"If the building public would only look upon conditions as they exist and study the economic reasons making for the creation of larger business in ceramic arts at this time, they would see, exactly as we do, the tremendous possibilities of the hour. Foreign marbles are hard to get. That makes for greater demand in faience adornment."

NEW ENGLAND PRICES REACH HIGH LEVEL

Building materials, including brick, are firm in Boston with spring activity already being felt. The prospects for building operations are excellent. In fact, they are so good that brick prices have reached about the same levels as those on the New York market, and some builders are contemplating looking to the Hudson River district for future supplies of this commodity, as the capacity of New England plants is being taxed beyond all precedent in filling the orders on hand.

Philadelphia reports further evidence of expanding activity in building, indications pointing to a large amount of new construction during the coming season. Work is progressing on several large building projects in Pittsburgh and numerous new contracts are being figured, but January permits were not very large in volume.

Industrial construction seems to mark building activity in Baltimore, the erection of plants for new enterprises continuing in good volume. Richmond, Va., building figures show a further increase, permits for January exceeding those for the same period last year by $140,752.

Weather conditions in Chicago and thruout the West were less favorable to building during the latter part of January and the first week in February, but there was no lessening in demands upon brick manufacturers and building material dealers. During the week ending February 5, Chicago building permits were again conspicuously large in value, being $2,600,000.

DETROIT BUILDING SHOWS BIG GAIN

Detroit building figures for January included 391 operations costing $1,676,350, showing a gain of about forty-seven per cent in the number of buildings over the same month a year ago, and about sixty-two per cent in cost. None of the permits covered large operations. If the plan filings for February to date are to be taken as an indication of what the total will be for the month, it is a certainty that February will compare very favorably with the same period in 1915.

Cleveland reports an increased demand in building materails, caused by a mild winter which has encouraged construction work. The number of permits is holding up well and indications point to a good season. Building operations for the past month in Milwaukee showed a substantial gain over January, 1915, and there is considerably more building in prospect. Building permits for January in Indianapolis amounted to fourteen per cent more than for the same month last year.

General business conditions are still showing improvement. In fact, so great have been the advances in many lines of trade that it would be easier to mention the unsatisfactory features than the favorable ones. Passing over another record month in the production of pig iron, unusual activity in the textile industries, a decrease in the commercial death rate and huge bank clearings, and returning to clayworking, we find in one branch of the industry a situation that is representative of nearly all.

PREMIUM ON POTTERY SALESMEN'S TIME

"I couldn't go in and help myself to samples as in previous years," said a Chicago pottery buyer in describing a recent trip to East Liverpool, Ohio, "but had to wait until some member of the sales force could get away from another customer to give me his time. I planned to visit four potteries in a day, but by evening I had been in just one. Never saw anything like it before, and I have been making that trip for several years."

Nearly every buyer who attended the recent pottery expositions in Pittsburgh and East Liverpool had the same story to tell. A number of Canadians were conspicuous among the visitors—one man coming from Winnipeg in search of a good line of dinnerware and another who had never been in the American pottery district. A record volume of business was realized from these expositions, many of the potteries receiving more orders than they can fill for several months.

IN *the* WAKE *of the* NEWS

Being Brief Mention of a Host of Interesting Happenings in the Varied Fields of Clayworking

PERSONAL

Walter Berwald, son of John Berwald,—the latter formerly connected with the Davenport (Ia.) Brick and Tile Company—is the manager of a new concern—The American Silo and Tile Company of Davenport. For the past few years, Walter was also connected with the company of which his father was secretary, and while there made an enviable reputation as a salesman.

Daniel Raymond, manager of the Garden City Pottery Company, San Francisco, Cal., returned home during the latter part of January, after spending several weeks in the East. He is now making the rounds of the greenhouses.

John H. Mead, superintendent and general manager of the Onondaga (N. Y.) Vitrified Brick Company, died suddenly on January 27. Mr. Mead was well known in clayworking circles, having been connected with the above company for more than ten years.

J. Murray Thompson, of Pittsburgh, Pa., has been elected superintendent of the Clymer Brick Company, to succeed George W. Lenkard, who has resigned on account of ill health.

George F. Clippert, a Detroit (Mich.) brick manufacturer, has left for an extended western trip. He was accompanied by Mrs. Clippert who will remain indefinitely in the West.

A New Sewer Pipe Truck

that is built in three different sizes:
No. 1. To handle 18"-20" and 24" pipe.
No. 2. To handle 27" and 30" pipe.
No. 3. To handle 33" and 36" pipe.

This Truck will be manufactured with the same care and skill shown in our Sewer Pipe Presses, Wheelbarrows, Dry Pans, etc. Send at once for descriptive matter.

The Toronto Foundry & Machine Co.
Toronto, Ohio

Heraeus LeChatelier
Pyrometers
"The Ultimate Pyrometer"

Are designed and constructed to give lasting and uninterrupted service. Their higher first cost is many times offset by their lower maintenance cost.

180 Kilns have been equipped with Heraeus Pyrometers in the past year. Let us refer you to some who have them.

Send for New Catalogue

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Bristol's Recording Instruments
For Pressure, Temperature, Electricity, etc.
Awarded the Grand Prize
AT THE PANAMA-PACIFIC EXPOSITION

Bristol's Recording Thermometers and Pyrometers used extensively to Control Kiln Temperatures

Bristol's Recording Instruments are unique in their extreme simplicity of construction and are guaranteed for satisfactory service under severe working conditions.

Write for Catalog 1400

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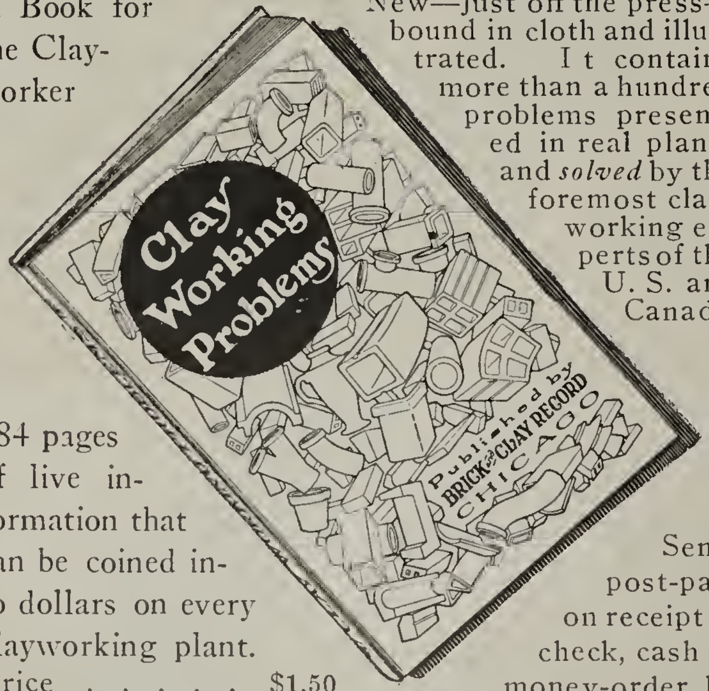
BRANCH OFFICES
BOSTON NEW YORK PITTSBURGH CHICAGO


Clay Working Problems
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101 Questions Answered

A Book for the Clay-worker

New—just off the press—bound in cloth and illustrated. It contains more than a hundred problems presented in real plants and *solved* by the foremost clay-working experts of the U. S. and Canada.

184 pages of live information that can be coined into dollars on every clayworking plant.
Price $1.50

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Brick and Clay Record
445 Plymouth Court CHICAGO

C. B. Hutton, president of the Western Brick and Supply Company, Hastings, Nebr., was a recent visitor to Iowa, spending a week at Ames during which he attended the annual meeting of the Iowa Clay Products Manufacturers' Association.

R. C. Gangewere of Chattanooga, Tenn., writes us that all of the brick plants in that city but one, are shut down on account of high water. He adds that there is "more business in sight than there has been for several years."

Thomas Galbreath, who for several years has been bookkeeper at the Acme Brick Company's plant, Danville, Ill., has been promoted to the position of assistant superintendent.

D. L. Edwards has recently joined the sales force of the Carlyle Paving Brick Company, Portsmouth, Ohio.

A. E. Jennings of Central City, Ky., is planning to establish a drain-tile plant at Rockport, Ky.

CALIFORNIA

The Remillard Brick Company is erecting a handsome brick office building for the use of its yard force at First and Clay streets, Oakland, Cal.

N. Clark and Sons, San Francisco, Cal., have booked a large sewer contract at San Bruno, but are not delivering any pipe at present, because of the rainy weather.

The Stockton Fire and Enamel Brick Company, San Francisco, Cal., has moved its office from the old California Safe Deposit and Trust building to room 213 Rialto building, at Mission and Montgomery streets.

F. A. Costello, president of the California Pottery Company and the California Paving Brick Company, is now making his San Francisco headquarters at 821 Chronicle building. The yard and office at Twelfth and Mission streets are still being maintained in the same location.

The California Pottery Company, Oakland, Cal., has cut down its output of sewer-piper for the present, but is keeping its kilns in operation, taking advantage of the dull season to burn some experimental paving brick for the California Paving Brick Company.

The Diamond Brick Company, of Pittsburg, Cal., is installing pyrometers at its plants in what it believes to be the last step toward making the plant thoroly modern and efficient. Some brick are now being burned, but for immediate needs only, as the fuel cost is much higher during the heavy rains than it is at other times of the year.

The California Paving Brick Company, San Francisco, Cal., has been experimenting with a shale from the Sierra foothills for several months, turning out some very good "pavers" which have stood a satisfactory rattler test. If the experiment continues successful the product will soon be put on the market. In fact, plans are already under way for a factory in Calaveras county.

The Steiger Terra Cotta and Pottery Company, San Francisco, Cal., has about exhausted its reserve stock of fire-brick and reports a much more active demand this month than at previous periods, due to a resumption of operations in many of the lumber mills. The face-brick and terra cotta departments of the company are also busy.

COLORADO

The Delta (Colo.) Brick and Tile Company recently received notice from Washington, D. C., that it had been

awarded the contract for furnishing 400,000 brick for the new federal building at Grand Junction in that state.

CONNECTICUT

The Barrington (R. I.) Steam Brick Company's plant closed on January 15 after one of the most prosperous seasons in its history. This is the latest date that this plant has kept open, most of the brickmaking establishments in New England having long since closed for the winter. However, shipments on several large orders are being continued from the Barrington plant.

Probably the first of the Connecticut brick manufacturers to resume operations for 1916 is the J. H. Connley Company, of New Britain, whose plant was opened on February 1. The Connley company's yard is equipped with a steam drier, which enables it to operate, so far as that division of the manufacture is concerned, even in midwinter, if necessary.

The annual meeting of the Central Connecticut Brick Company, Hartford, Conn., was held on January 24. Reports indicated that the past year was one of the most successful in the history of the company. The following officers were elected: Joseph Towers, president; George H. Todd, vice-president; Frank H. Holmes, secretary, and H. S. Tallard, treasurer.

Brower and Best, brick manufacturers of Thompsonville, Conn., are busily engaged in making daily shipments to Bridgeport, where they have an order for the immediate delivery of two million brick, about one million of which were on hand when cold weather necessitated closing the plant. An effort will be made to reopen it an early date, in order to fill the remainder of the order. The company's normal output is four million brick a year. An offer from Bridgeport builders to take the entire output of the kilns for the next two years is now under consideration. However, the plant is being equipped with electric drive, which, together with a competent force of men, it is hoped will greatly increase the annual production, bringing it up to six million brick.

The price of building brick at Connecticut yards has advanced from eight to ten dollars per thousand since the opening of the new year, and there are said to be indications of still higher prices when the spring demand attains its height. Workmen have already served notice that they will ask for higher wages when the plants reopen, and, this, with an anticipated shortage of labor, it is believed will result in a material increase in the cost of manufacture. Furthermore, it is said builders are beginning to turn to New York manufacturers to take care of the anticipated brick shortage in New England. Even with plants in the vicinity of New Haven turning out an average of over 150,000,000 a year, the supply is inadequate to meet local demands.

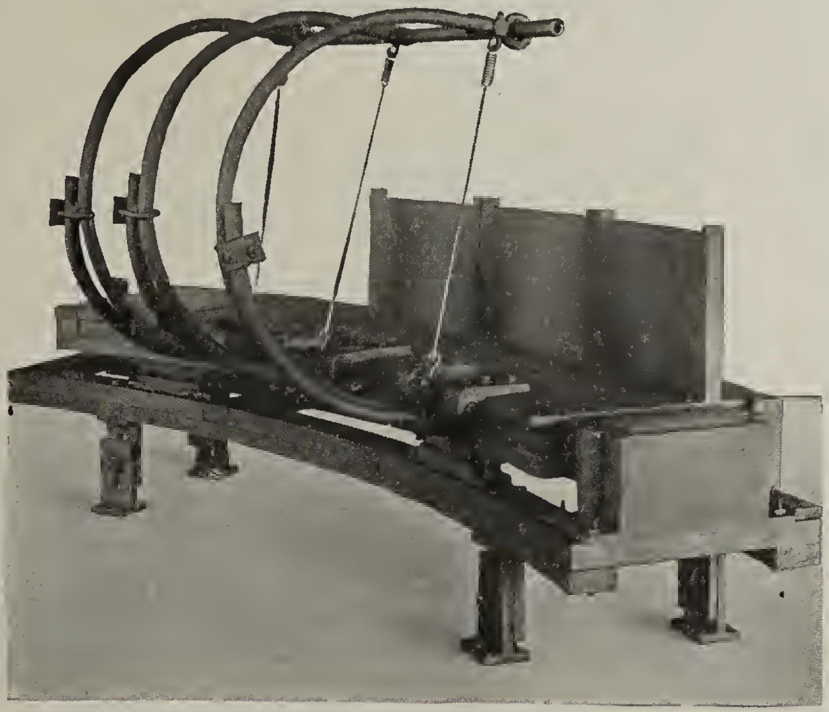
DISTRICT OF COLUMBIA

The fourth annual meeting of the Chamber of Commerce of the United States was held at Washington, D. C., on February 8, 9 and 10. Among those present who are identified with the clayworking industry, were: C. P. Mayer, John W. Sibley, Eben Rogers, L. Perry West, Warren [illegible], Hubert Somers and others representing the National Brick Manufacturers' Association; S. C. Martin and R. D. T. Hollowell of the American Face Brick Association; R. D. Hatton and Cyrus Borgner of the Refractories Manufacturers' Association and W. E. Wells, representing the United States Potters' Association.

ILLINOIS

At the annual meeting of the Illinois Brick Company,

New Silo Block Cutting Table
Cuts Radially



Sioux City (Iowa) Brick & Tile Co. writes as follows:
"Beg to advise we have run about 50,000 blocks since receiving the table. It works very satisfactorily indeed. Will gladly recommend the machine. By using the lever to shift the table back to its original position after the cut is made, one man has no trouble operating it."

Bulletin G-25 is ready.

It's costing you money to be without modern equipment.
Don't call it expense—just an investment.

Made in Brazil, Indiana—The Clay Product Center
CRAWFORD & McCRIMMON CO.
Estd. 47 yrs. BRAZIL, IND.

THE KILN THAT PAYS

The Improved Hook Patent Up and Down Draft Kiln

It eliminates the waste of imperfect ware, and burns with a uniform hardness both top and bottom. It increases output by shortening the timo by one-quarter to one-half usually required for burning each kiln, and lowers costs by saving in time and fuel.

The above is a Photograph of a 26-ft. IMPROVED HOOK PATENT UP AND DOWN DRAFT KILN at the Forest Brick & Tile Works, Forest, O., that is burned regularly from 45 to 50 hours, and only consuming from 9 to 10 ton of coal to each burn.

We are doing it for others; we can do it for you. THE IMPROVED HOOK PATENT UP and DOWN DRAFT KILN will solve your production problems. Sold only by the OHIO KILN CO.

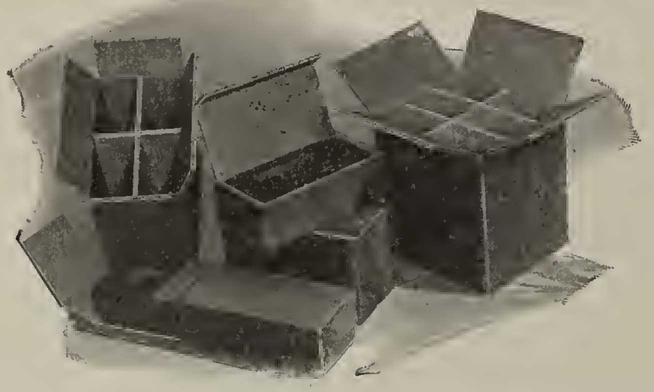
LET US PROVE OUR CLAIMS.

Mr. C. Hook is associated with our Company, and no plans leave the office without his stamp of approval.

For further information address

Ohio Kiln Company, Vigo, Ohio

You Are Judged By the Samples You Send



Have you ever considered this fact, that your sample brick are your representatives, and that your company and its ability to furnish good material in good condition are judged by the condition in which the sample is received?

It costs but little to pack your brick in Hinde & Dauch Corrugated Boxes, but you can be sure they will give thorough protection—no chipped edges or broken corners when these boxes are used. The sample will be a credit—not a disgrace.

Try it for yourself

The Hinde & Dauch Paper Co.
Sandusky, Ohio

LEHIGH PORTLAND CEMENT CO.
LEHIGH
ALLENTOWN, PA.–CHICAGO, ILL.

Why Most Brick Streets Use Lehigh Cement

Because it is not only high in strength but dependably uniform.

A perfect vitrified paving block of your manufacture used with a perfect cement filler of **Lehigh** Cement makes a permanent street for the city and a permanent highway for the country.

These are only a few reasons why more brick streets use **Lehigh** Cement than all others combined.

You Cannot Afford to Take Any Risk

Lehigh Cement is the perfect cement. Specify it always. It protects you. Set the proportions for the mixture. Adhere to them. Then your job will be uniform throughout.

LEHIGH
CEMENT

Cement Grout for Permanence.

Chicago, Ill., Carl Netterhorst was elected secretary, succeeding W. G. Bohnsack, resigned, and G. F. Perkins was elected treasurer to fill a vacancy. All of the other officers, including William Schlake, president, were reelected.

Mayor Bradford and City Engineer Hainsworth of Ottawa, Ill., were recent visitors at the plant of the Alton (Ill.) Brick Company, to which they came for the purchase of brick required for new paving work in Ottawa.

The annual meeting of the Purington Paving Brick Company of Galesburg, Ill., was held on January 19 at which the following officers were elected for the ensuing year: F. G. Matteson, president and treasurer; George C. Prussing and C. B. D. Howell, vice-presidents; W. H. Terwilliger, secretary, and W. G. D. Orr, general manager.

Prospects for the coming year are good, according to reports read by officers of the Gem City Pressed Brick Company, Quincy, Ill., at its annual meeting, held on January 22. Orders now on the books of the company call for from 700,000 to 800,000 brick, and as soon as weather conditions permit, operations will be resumed at the plant. Ezra Best was elected president for the ensuing year, Fred. Wilms, vice-president, and John T. Hummert, secretary and manager.

A new $40,000 brick and tile plant is soon to be erected at St. Anne, Ill., according to information which has just been made public. The promoter of the new corporation is Fred. H. Meier, formerly president of the St. Anne Brick and Tile Company, but who recently disposed of his interests in that concern to U. A. Cote, secretary of the company. It is said that the new plant will employ about thirty-five men. An option has already been procured on sixteen acres of land near the village. The new plant will probably be located a short distance south of St. Anne on the west side of the Chicago and Eastern Illinois Railroad.

INDIANA

The Jeffersonville (Ind.) Brick Company is completing the repairs at its plant, says R. L. Akers, properietor. A new stack has been built and other minor improvements made.

IOWA

The Iowa State Drainage Association will hold its annual meeting at Fort Dodge, Iowa, Feb. 24 and 25. M. F. P. Costelloe, of Ames, Iowa, is the secretary, and any inquiries regarding the coming meeting should be addressed to him at Ames.

KENTUCKY

The Coral Ridge Clay Products Company's plant is operating to capacity and making regular deliveries to a number of jobs in Louisville. According to George H. Fiedler, general manager, it looks as though there will be no let-up in the demand for some time to come.

The street paving program of the Louisville (Ky.) Board of Works, which has just been announced, provides for a considerable amount of brick construction during the coming year. Under the present system of paving, all Louisville streets are provided with brick gutters, no matter what may be the nature of the paving. Out of fifteen streets which are to be paved during 1916, five call for brick.

Drain-tile manufacturers and dealers in Louisville, Ky., have been following up the warnings which have been issued by the county health officer, Dr. J. I. Whittenberg, to residents of Jefferson county outside of Louisville, whose dwellings are without adequate sewage disposal. These warnings, which number four hundred, relate to water drainage only and call attention to the fact that the law prohibits standing

or stagnant water where it is possible for the owner of the property to provide drains to carry it away. Drain-tile makers are urging the recipients of these warnings to use clay tile for draining their property.

An important development in Kentucky clayworking circles during the past few weeks has been a statement from Commissioner of Agriculture Matt Cohn of Danville, to the effect that his administration would give all silo materials an even chance in the work done by his department. The previous commissioner was very partial to the concrete silo, even going so far as to actually assist farmers in the erection of this type of silo. There was a standing offer to all Kentucky farmers for the use of the forms which the state owned and these have been freely used. While the Kentucky Retail Lumber Dealers' Association were primarily responsible for the new stand of the state agricultural department, manufacturers of clay silos will get their share of the benefits.

MAINE

The Saco (Me.) Brick Company is enlarging its drying yards, rebuilding several of the kiln sheds, and making a number of other improvements in anticipation of a busy spring and summer. The company already has a number of large orders on its books. The company will furnish the brick for a four-story addition to the storehouse of the Pepperell Manufacturing Company's mill on Main street, Saco, also for a storehouse for the same company in the adjoining city of Biddeford, to replace a building destroyed by fire last year. In order to fill these orders it will be necessary for the company to get as early a start as weather conditions will permit, and improvements at the yard are being completed as rapidly as possible with this end in view.

MASSACHUSETTS

In addition to making brick during the coming year, L. H. Trubb, who operates a plant at Amory, Miss., will add drain-tile to his lines.

MICHIGAN

The Delta Brick and Tile Company, of Detroit, Mich., has been incorporated with a capital stock of $10,000 by E. A. Foote, S. H. Wightman and D. L. Blair.

The Detroit (Mich.) Board of Public Works has requested an appropriation of $24,190 from the city council to pave a number of new streets, and $80,000 to make repairs to some old ones, using vitrified brick. If granted, this will make a total appropriation of $104,190 for brick paving during 1916.

The Britton (Mich.) Pressed Brick Company, thru its treasurer, Frank I. Connell, reports the installation of a new 50 by 200 ft. steam dry shed two stories high, and two additional kilns. Elevating and clay digging machinery, as well as two new boilers, will be installed within the next month or two at this plant.

A very satisfactory business for 1915 was reported at the annual meeting of the Saginaw (Mich.) Paving Brick Company held recently. It was also stated that the demand for face-brick made by this company has grown to such proportions during the past few years that the greater part of the plant's output is devoted to this product. The company is now catering more to the face-brick end of the business than to paving-brick, altho it is still manufacturing and selling "pavers." The following officers were elected for 1916: John H. Qualman, president and general manager; Rudolph Otto, vice-president; James H. Sleeth, secretary-treasurer, and Charles H. Kepler, superintendent.

NEW JERSEY

The Trent Tile Company, Inc., Trenton, N. J., is a new

Carbide-Paint
Prevents Dry Car Rust

This paint is spread in a thin layer over the dryer cars. It clings tenaciously to the metal, and by virtue of its being fireproof, moisture proof and acid proof the metal is protected from the corrosive action of alternating baths of hot, moist sulphur laden gases and the open air. It will save hundreds of dollars for the big dry car user.

We have purchased the manufacturing rights for Carbide-Paint from its inventor and patentee, E. R. Stowell.

Get our literature at once.

The G. B. Stock Xylite Grease and Oil Co.
Port Huron, Mich.
Brickmakers Headquarters for Greases and Oils

Your Ware Is As Good As You Make It!

To make a merchantable class of ware it devolves upon you to perfect each single phase of the manufacture—from the selection of the clays to the sorting of the finished product.

The correct measuring and mixing of two or more raw clays is of tremendous importance.

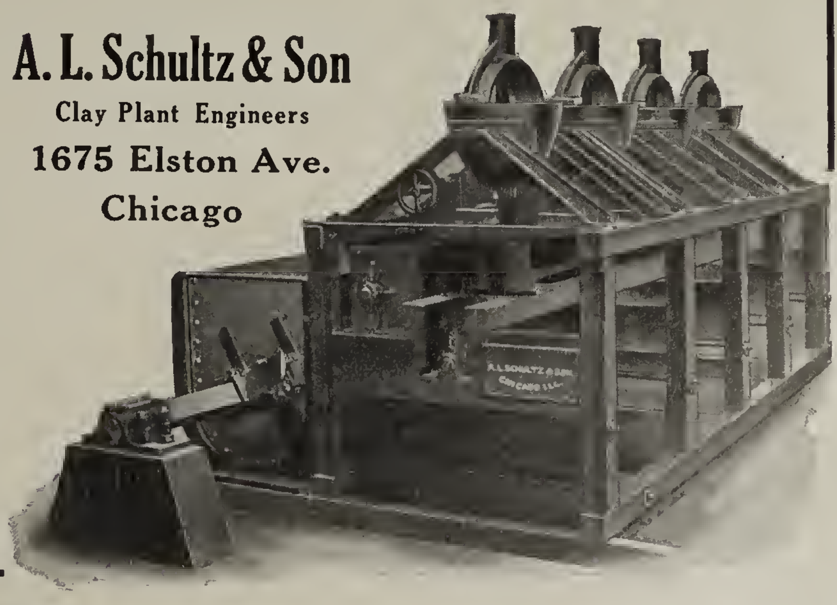
Financial success or financial failure depends upon the ability of your men or machines to standardize the batch.

To depend on your men to measure, to guess, to mix with shovel—or slide gate and chute is to have the batch run wild.

A dependable machine is your only alternative, and that machine is the Schultz proportioner—it measures, mixes and tempers. Set it and leave it. It does its work well.

Get details from

A. L. Schultz & Son
Clay Plant Engineers
1675 Elston Ave.
Chicago



Tank and Silo Equipment

We buy Glazed Tile Silo Blocks and sell Wood Tanks with steel towers for their elevation. You serve yourself by telling us what you have to sell and we open Opportunity's Door, showing you wherein each may be served in silos or tanks. Both are needed by every *Manufacturer and Stockman* and their installation means profit to live builders and contractors. Open up—tell us your occupation or trade—a clam never gets anywhere! We have propositions that may interest you.

Kalamazoo Tank & Silo Co.

Ft. Worth, Texas Kalamazoo, Mich.

POSTERETTES

200,000 of the "Build with Brick" posterettes have been used by brickmakers throughout the country. As many pieces of mail and express matter have carried the "Build with Brick" slogan to a vast army of prospective homebuilders.

Here is the second edition—the stamp advertising paving-brick. It tells a story that carries a moral—and that moral means better business for the men who make paving-brick.

How about using some of them—now?

Printed in THREE colors

Gummed and ready to stick on your letters, envelopes and packages.

$1.50 per thousand postpaid

Send your orders to

BRICK AND CLAY RECORD
445 PLYMOUTH COURT CHICAGO

concern which has been organized to take over the business of the Trent Tile Company, whose affairs were concluded recently at a receiver's sale. Charles B. Case, of Case and Cain, real estate brokers, bought the plant for $25,000. Operations have been resumed, the plant having been closed but a few weeks while the sale was being negotiated.

NEW YORK

All of the output of the Ithaca (N. Y.) Brick Company, from February 15 to April 1, has already been contracted for, according to I. K. Bernstein, president and manager. The plant has been reopened for the 1916 season, and expects to continue in operation for the entire year. A machine has been installed for the manufacture of drain-tile, which will soon be an important part of the general output. Later on, the present capacity of 30,000 brick daily will be doubled.

NORTH DAKOTA

The Dickinson (N. D.) Vitrified Tile Silo Company is a new concern which has been organized by Charles Bakke, a general contractor, and W. J. Elliott, general manager of the North Dakota Pressed Brick Company. The company will manufacture and sell hollow-tile silos complete and erected upon the farm. Under this plan it will be possible for the company to guarantee every silo which it builds. Mr. Elliott has a special frost-proof door and a system of reinforcing which he intends using in connection with the marketing of these silos.

OHIO

The Belden Face Brick Company, of Canton, Ohio, is building a new plant at Port Washington, Ohio.

The Barkwill Brick Company of Cleveland, Ohio, has taken over the property of the Standard Brick Company of Brooklyn, Ohio. The transfer was made Feb. 1.

The Dennison (Ohio) Clay Company, a sewer-pipe company, which was organized a little more than six months ago, has increased its capital stock from $10,000 to $120,000.

Business is good, according to the Federal Clay Product Company, of Mineral City, Ohio. Two new machines have recently been installed at this company's plant, as have also some new kilns.

The Keim Brick & Tile Company of Louisville, Ohio, has built an 80 ft. boiler stack, two new kilns and an eight tunnel drier. This will increase its daily capacity to 50,000.

C. M. Miller, of The Colonial Pressed Brick Company, Mogadore, Ohio, reports that the January, 1916, sales were double those of any previous January in the company's history. This plant makes a superior rough face-brick and has recently adopted the vertical texture.

According to Frank E. Mohr, of Columbus, Ohio, the Mohr-Minton brick plant at McArthur, Ohio, is to be reopened about March 1 with a full force of men. In the meantime, an inventory of the plant is being made to ascertain what repairs and improvements are necessary.

The manufacture of better hollow-tile and silo blocks during the coming year is the aim of the Mowrystown (Ohio) Brick and Tile Company, of which W. Z. Beltz is proprietor. The company is planning to make some improvements in its plant by the installation of a larger auger machine and disintegrator.

By interviewing prospective builders and showing them the merits of hollow tile construction, the Minerva (Ohio) plant of the Metropolitan Paving Brick Company has been doing some good work in extending its market for that commodity. R. M. Schory, of the company, reports the the installation of a new 250 H. P. engine and a new kiln at the plant.

The Alliance (Ohio) Clay Products Company reports a number of changes and improvements at its plant. Crushers and clay feeders for the dry-pans are now being installed. Also a new six-ton gasoline locomotive has been purchased to replace one of three tons which was becoming too light to do the work required since the installation of a larger electric shovel in the pit.

That Cincinnati (Ohio) is going to be as good a market for the brickmaker during 1916 as it was the previous year, is indicated by the fact that the valuation of buildings for which permits were issued in January was only $5,455 behind the figure for the corresponding month in 1915; the number of permits was substantially larger than last year, a gain of 163 being made. It is evident from the last figure that the jobs authorized were mostly of the smaller type, giving a wider distribution of brick orders at better prices. Local brick manufacturers and dealers are pleased with the way in which the year has started, and look to see business improve as weather conditions become more favorable.

With a capacity increased to a million brick a year, Arthur C. Wolfe, of Mt. Vernon, Ohio, is entering upon a season that looks very promising. A new clay shed has been built at the plant, measuring 40 by 130 ft., this addition being accompanied by a change in the pallet system. A new clay feeder will also be installed within a few months. The company has announced its intention to produce nothing but a hard burned brick this year, to meet competition from nearby paving brick plants, which are also making "builders." This plant is manufacturing a common sand-mold brick entirely under cover, thus eliminating washed brick. Down-draft kilns are used in burning, a fine quality of hard building brick being produced by this process.

OREGON

Preliminary plans have been completed for the proposed plant of the Warrenton Clay Company, to be built for the manufacture of sewer-pipe and other clay products at Astoria, Ore. The first unit will cost $70,000. George W. Warren is president and Warren Overpack is general manager of the company.

PENNSYLVANIA

The James Gardner Brick Company's plant at Lockport, Pa., which was destroyed by fire about a month ago, is being rebuilt. Replacing the old building, are substantial brick structures. The plant is owned and operated by Norman Young, of Bolivar, and his brother, Peter Young.

Jacob K. Boyer, Milton J. Boyer and John W. Rhode have purchased the stock and machinery of the Kutztown (Pa.) Brick Works, including a lease on the property, from Keiser and Miller, of Topton, Pa., who recently operated the plant. The new company will start the manufacture of brick just as soon as weather conditions permit. It is expected that a production of two million common brick will be reached at this plant.

Last year was an exceedingly prosperous one according to reports from the Yingling-Martin Brick Company, whose plant is near East Johnsonburg, Pa. The plant was closed for a few days recently in order that some necessary repairs might be made, following a full year's run, during which time approximately fourteen million brick were made. At the an-

Under Your Boilers You Burn Your Coal!

How many tons each month? And, think, what is the total cost?

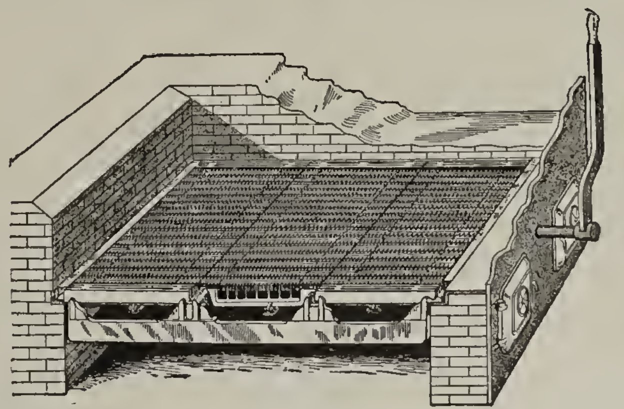
You can, if you will, reduce that monthly bill by 25 to 35 per cent.

You can burn slack and screenings where formerly you were compelled to buy, for big cash, big tonnages of Steam Lump.

Your boilers will develop the same, or an even greater horsepower, with low-grade coal, and at a wonderfully reduced cost.

Sure—the Answer is

Martin Non-Dumping Antifrictional Grates



Mr. J. M. Adams uses them at the Ironclay Plant and many other well-kuown companies have them installed

Send for distinctive proofs to

The Martin Grate Co.

347 S. Dearborn Street Chicago, Illinois

From a Burner's Standpoint

The plans of the kiln are both commonsense and convincing, but the actual performance of the Hook Patent Kiln is absolutely convincing—because it bears out the promise of cheaper, better burns.

Here above is one of our kilns at Continental, Ohio—and below is the testimonial letter:

Continental, Ohio, Jan. 13, 1916.
Hook Patent Kiln Co., Vigo, Ohio.

Gentlemen:—Answering your request for a statement of the comparative results obtained in our kiln before and after having changed to your system, we wish to say that we are perfectly satisfied with the kiln.

Before changing this kiln to your system it took from 70 to 80 hours to make a burn with an average fuel consumption of 12½ tons of coal. The percentage of cull ware was high and it was necessary to repair the kiln almost every time it was burned, although it had been used only the one season.

Although we have used your system only one summer the saving has much more than paid the total of your charge, and the material and labor for making the change. Since remodeling to your system we have not put one cent in repairs.

When we have reasonably dry tile, we can watersmoke 15,000 4-in. tile in 12 hours and complete the high fire in 21 hours, which is 33 hours from start to finish. The fuel consumption averages 7 tons to the kiln. We have very little loss and burn nice uniform ware from top to bottom, every time, which we could not do before changing.

On account of insufficient drying capacity, it has often been necessary to place very wet ware in the kiln. Last summer we made a practice of setting the upper five tiers of ware with tile so wet that we had to set them on end on the truck to take them into the kiln, for if laid flat, the weight of the tile would crush the bottom tile.

Your system works just as well on brick, although, naturally, it takes longer than when burning tile.

The kiln we originally built was represented to be much superior to yours, but we can say that your system is far better than any other we have ever used or seen.

If anyone makes inquiry regarding your system, we will gladly give them any information we can.

Very truly yours,
Snyder Bros., by James Snyder.

Hook Patent Kiln Company
Vigo, Ohio
Canadian Office: 250 Dufferin St., Toronto, Ont.

nual meeting of the stockholders held on January 13, all of the officers of the company were re-elected for another year.

The recently organized Wyomissing Brick Company, Reading, Pa., has purchased the plants of the Perkiomen Brick Company, located at Wyomissing and Montello, Berks county, Pa., and farm land at Vinemont. The price, according to the deeds recorded, was $125,000. These properties were bought by the Perkiomen Company from the Montello Brick Company some years ago.

The Glen-Gery Shale Brick Company has erected at its plant at Shoemakersville, Pa., a sign 400 ft. long and 50 ft. high. A brick effect is painted upon it in red and white, bearing the inscription, "Glen-Gery Brick." The sign can be seen for a distance of two miles. The product of the plant at Shoemakersville is finding its way into six different states. Recently large shipments were made to Boston, Mass., and Syracuse, N. Y., and the firm is now filling a large order to be shipped to Baltimore, Md. The Wyomissing plant of this company will devote its capacity during the coming year to the manufacture of shale building brick. The Shoemakersville plant turns out these in addition to paving brick. The company will soon install a large quantity of new machinery at the Wyomissing plant.

TENNESSEE

The Fulcher Brick Company, of Nashville, Tenn., has been awarded the general contract for the construction of the new polytechnic school building at Cookeville, Tenn. The brick to be used in this building, will, of course, come from the kilns of the Fulcher Company.

TEXAS.

The Groesbeeck (Tex.) Brick Company has been incorporated by C. S. Brindley, R. L. Underwood, Dan Park and C. C. Frampton, with a capital stock of $17,000.

A charter has been granted the Bridgeport (Tex.) Brick and Tile Company, the incorporators being Ben. J. Tillar, V. T. Simmons and A. J. Clendennen, all of Fort Worth, Tex. The company was organized to take over the property of the old Wise County Brick Company, sold recently at a trustee's sale. The plant will be put in operation at once by the new management.

VIRGINIA

The plant of the West Brothers Brick Company located at Relee, Va., a few miles south of Washington, D. C., is again in operation after having been closed some time for repairs.

WASHINGTON

The office of the Gross Brick Company, located at Ruston, near Tacoma, Wash., was destroyed by fire on January 27.

The Chehalis Brick and Tile Company, Centralia, Wash., has applied to the city to furnish four hundred feet of steel rails for the construction of an extension of the company's clay car tracks to its clay bank at the north end of the city. This company is at present taking clay from a bank that is causing considerable trouble, especially in keeping open a certain street that passes it.

WEST VIRGINIA

The Wheeling (W. Va.) Tile Company has voted to increase its capital stock from $100,000 to $200,000, and is planning to increase its output by making larger patterns in tiles. This company started in business four years ago, using the former plant of the Wheeling Potteries Company. Of the $100,000 in new stock, $50,000 will be issued at once to the present stockholders at par, and $50,000 will be retained in the treasury, to be issued later.

POTTERY NOTES

A Resume of the Activities of the Potters and Some Mention of Their Plans for the Future

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The action of the Ohio State Board of Health in issuing an order that glass and pottery articles used at soda fountains and in restaurants must be steamed, boiled and dried will have considerable effect upon the amount of business that has been obtained from these sources by manufacturing potters in the past. This is particularly true in view of the fact that where the above cleansing processes are impossible, the board has ruled that paper cups be substituted. Potters have of late being doing a large business with wholesale drug houses and confectioners, heavy orders having been received for footed sundaes, four-inch plates, bouillon cups, handled mugs and similar articles made from clay. Should the order of the board of health stand, there is little doubt but that the major portion of this business will be lost, at least so far as Ohio is concerned.

Stoneware pottery manufacturers in the Zanesville and Crooksville (Ohio) district are giving more than passing consideration to the use of tunnel kilns and before another six months has passed it is more than likely that a second kiln of this type will be erected in a Muskingum Valley pottery. The initial installation of this type of kiln was made at New Castle, Pa., where sanitary ware is being burned successfully. Up to within a year or so ago, up-draft kilns were used exclusively in American potteries. Manufacturers who have inspected the tunnel kiln, however, now admit that the time is fast approaching when it will replace the present up-draft kilns.

Six new kilns have been built at the plant of the Summit China Company, Akron, Ohio, to replace worn out units. C. P. Reddrop, general manager of this company, states that since the pottery was taken over by the Bowman interests of Cleveland it has greatly increased its business and is now being operated to capacity. The company has placed a new plain dinner shape on the market, and before long, will announce another fancy shape.

The Louisville (Ky.) Pottery Company is operating on a full time basis with numerous orders on hand and with every prospect for a large business this year. Altho it is somewhat early for the development of a strong demand in florists supplies, yet several orders of substantial proportions have been received for these commodities. The company is now installing a seventy-two chamber filter press to be used in washing clay for flower-pots.

Mayfield (Ky.) pottery clay shippers have received notice from the Interstate Commerce Commission of the suspension of proposed increase in rates which were to become effective on March 16. May 16 has been named by the commission as the date upon which a final ruling will be made on the questions involved. The increases on clay were intended to apply on carloads to Ohio river crossing points and points beyond.

The Arequipa Potteries, Fairfax, Cal., had a demonstration at the arts and crafts exhibit of the Hillside Club at Berkeley, Cal., during the week ending January 15.

The Pacific Porcelain Ware Company states that its plant at Richmond, Cal., is operating steadily with prospects for a good business during the coming year.

Have You Tried Gandy Belting?

You have been reading about it for 37 years—provided you have been using belting for that length of time. And during all these years sales of

Gandy

Stitched Cotton Duck Belting

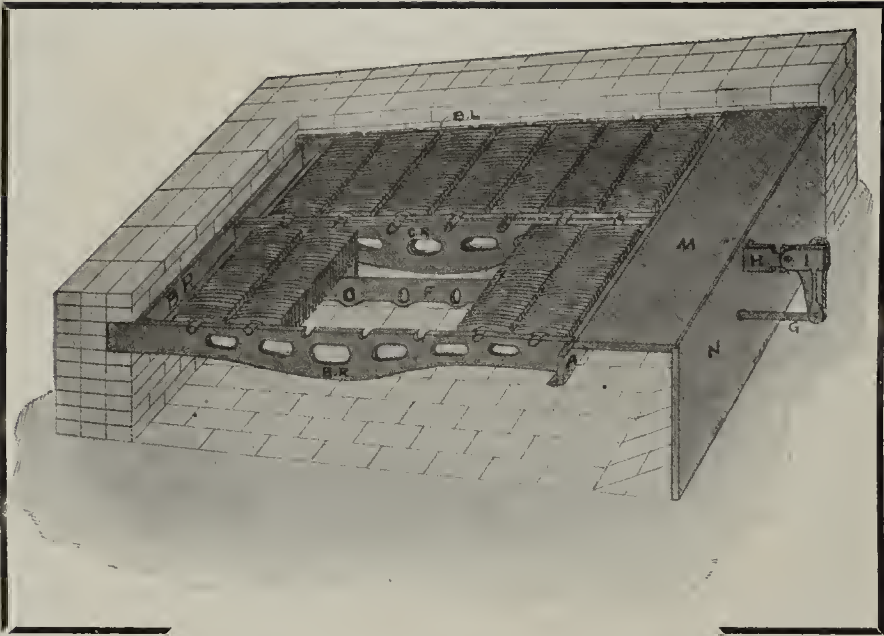
have increased constantly, so that you can feel positive that GANDY is a good sounding belting proposition, giving thousands of concerns satisfactory service for less money than they can get with any other.

Have you tried it yet? If not, investigate its possibilities now. It is water, oil and dust proof; made by a patented method that prevents surplus stretch, and has a tenacious hold on the pulleys that prevents loss of power through slippage.

Write us today for a sample and prices. Address

The Gandy Belting Company
732 West Pratt Street
Baltimore, Md.
New York Branch — 36 Warren Street

GANDY



We are selling them on 90 days' free trial, because we have so much confidence in

CYCLONE GRATES

They are wonderful savers of fuel, and will easily pay for themselves in just a few months in a reduced coal bill.

Just read these claims:

Even distribution of draft.
No fuel gets into ash pit.
Locks level.
Burns cheap fuel.
Burns less fuel.
No fingers to burn off.
Impossible to warp.
Easy and simple to clean.

That's exactly the kind of a grate you want.

Write now for our catalog.

CYCLONE GRATE BAR CO.
BUFFALO, NEW YORK

MACHINERY and EQUIPMENT

Being Descriptions of Such Machinery and Accessories as Our Advertisers Have to Offer and Such Announcements as Are of Interest to Our Readers

Something About "Iridium Augers"

The following letter from J. H. Chambers, president of Chambers Brothers Company, has much in it that is of interest—much that applies to what has already been written about hollow-ware machinery. It is dated February 4 and reads as follows:

I wish to congratulate "Brick and Clay Record" on having such a welcome contributor as A. F. Greaves-Walker. His direct straightforward manner of handling his subjects bespeaks the man of experience that adds much to the interest of his communications.

While I am not technically posted upon some of the subjects written upon, his article in your issue of February 1, about augers, sleeves, dies, and the importance of the relative adjustment of these factors in a clay forming and expressing machine, treats of a subject in which we have much interest, and expresses so clearly certain well established observances that I think many users of these appliances will give his article a second reading.

But, is it not amazing that at this day the conditions in any branch of the clayworking trade could make possible the statement that over 90 per cent of the augers used by tile-makers were prepared for efficient use after insertion in the tile-making machine itself, and at a cost to the tile-maker of from $200 to $500, or that any clayworker would accept from his machinery firm as a common occurrence, an auger against which he must suffer some $250 of lost product before getting that auger fit for commercial use?

One of our own customers a few months since, met our salesman with the statement that he had ordered an "Iridium Alloy Auger" for an end-cut brick machine. Iridium *sounds* good, and much was expected. Iridium because of its great hardness, is used to tip the points of gold pens, *and its market value is greater than that of platinum.* How much of it do you suppose that brickmaker found in a commercial casting weighing about 350 pounds?

Another customer told us he was using "Chilled Augers," and altho his plant was some 1,200 miles distant, we were curious enough to have him send us one. The lip of the auger thread was chilled, but all of the rest was an ordinary gray-iron casting, so porous in grain that any loamy material would stick fast to its surface rather than leave it.

While it is possible to use such augers with fat clays or shales, they are useless with much of the material of this section, and are not economical for any material.

The crystalline structure of the very hard irons is different from that of ordinary gray iron used for machinery castings. It cannot be machined, but may be ground and polished to a high degree with the aid of special facilities, all of which is essential for an *expressing auger,* whether taper or straight.

Only in foundries needing this hard material in sufficient quantities to justify special meltings of this alone, can one safely make such augers. A small percentage inadvertently mixed with ordinary machinery iron spoils the castings for machinery use.

We do not try to build everything that an iron foundry and machine shop might produce, but we are specialists on augers and dies for brickmaking machinery, having given the problem intelligent study and developed facilities especially for this work.

The customer for the "Iridium Auger" has returned to us. Notwithstanding that a Chambers auger without iridium costs more money, it is the cheapest auger per ton of product.

Osgood Appoints Northwestern Representatives

Copeland & Klingel, with offices in the Metropolitan Life Bldg., Minneapolis, Minn. have been appointed agents for the Osgood Company, in the Northwestern territory.

Mr. Copeland is directing his energies to locomotives, while Mr. Klingel will devote his entire time to the sale of Osgood steam-shovels. Mr. Klingel is particularly adapted for this work, having been for years a steam-shovel operator and later on a salesman.

The advisability of a salesman being also a sales-engineer is thoroly appreciated by the buyer, who wants to talk to, and buy from, a man who knows. Mr. Klingel knows, and on account of his actual experience is better able to give service to customers.

Halley's Comet—It Comes Every Two Months

Listen!—Some automobile drivers are so rotten that if they were running a car out in the Sahara Desert the chances are that they would bump into a hydrant.

And then—this: A note actually received by a school teacher from the mother of a sick pupil, in explanation of the child's absence from school: "Anna she was sick she had a head egg and a tooth egg and a ear egg. She could not go to school, she was laying all the time in bed."

Just two extracts from the "Book of Smiles," by the Standard Dry Kiln Company, of Indianapolis, Ind.

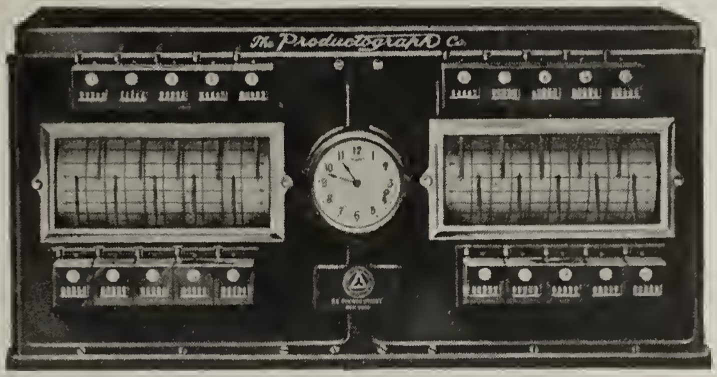
Kellys

The Smith Brick Co., of Omaha, Neb., has a 5-ton Kelly-Springfield truck. Altho it has only been in service since December 1, 1915, it has already demonstrated that with proper handling it will displace six teams.

Loading Brick Into a Kelly-Springfield

At present it is displacing three teams, even tho working under two handicaps, the first of which is not having capacity work to do in the winter time, and second, thru inadequate loading facilities, which, however, will be remedied soon.

It is expected that when the hot weather comes that the



The Productograph

AN AUTOMATIC ASSISTANT FACTORY MANAGER that will give you, hour by hour, in your own office, a mechanical accurate record of the lost time, the productive working time, the average speed and the output of each machine in your plant.

The accuracy of PRODUCTOGRAPH information is guaranteed by the fact that its story is actually written by the machines themselves. It will enable you to locate and correct the unsuspected errors that are now retarding your production and decreasing your daily profit.

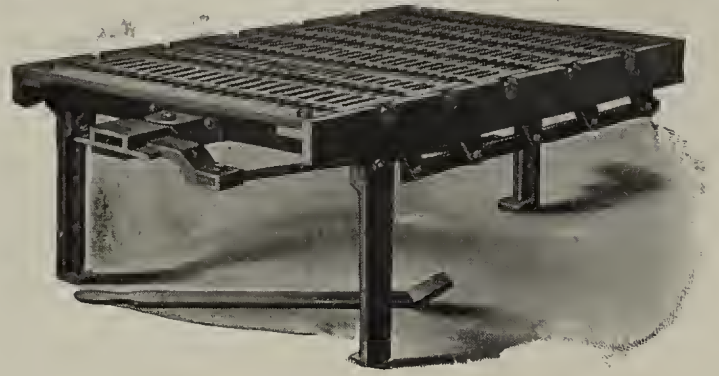
A prominent brick manufacturer who recently installed this system says "We doubt if there is a brick plant in the country which could not learn something that it would be to its advantage to know from the use of a PRODUCTOGRAPH."

Send for literature and full information.

The Productograph Co.

30 CHURCH ST. SLOCUM-AVRAM-SLOCUM MANAGEMENT NEW YORK, N. Y.

PUT THEM IN THIS WINTER



The Canton Kiln Grate

From the time of the first installation in the kilns of the Massillon Stone and Fire Brick Co. of Massillon, O., up to the present time, dozens of sets have been installed—and are giving utmost satisfaction. Get a trial set, and prove with them that you can save over one-fourth of your fuel bill. Put them in just one kiln—their utility and the saving accomplished, convinces that the Canton is the only way.

Efficiency BOILER Grates

Shaking and Dumping

The Canton is the grate to keep your fires clean and free burning, with the least time and labor, and with the fire doors shut. Absolutely no loss of fuel while shaking. It is easily installed under any boiler. Bars may be replaced while furnace is in operation.

Convenience, Economy, Durability

are three important features, and these combined with simplicity of parts, ease of installation and operation, must convince engineers of the unusual merit of Canton Grates.

Our catalog fully illustrates and describes them. Write for it today.

Elmer C. Miller, Proprietor, will be at the Convention, Hotel Statler, and will be pleased to see any one who is really interested in reducing their fuel cost in burning brick, both in the kiln and under their boilers.

The Canton Grate Company
1706 Woodland Ave., N. W. CANTON, OHIO

Kelly will be used exclusively on long hauls and teams and wagons on short hauls, and then, perhaps, there will be another Kelly.

H. H. Smith, the secretary of the Smith Brick Co., says the truck has fully come up to expectations and has been running almost constantly thru snow and ice.

The Clay Products Dryer

The American Blower Company of Detroit have just issued a new treatise on drying. It is a constructive and educational work, so different from the usual and former ideas of catalogs, that it is worthy of the highest praise.

Reproduction of Front Cover of American Blower Catalog

An authority said of it, after only 30 minutes perusal, "It is a lifetime of study and work in dryers and fans, condensed into 48 pages."

If you are a superintendent or in any way interested in a clay plant you should send for the book. It will bring your ideas on drying thoroly up to date.

Xylite, Fibre and Yarn Greases

Lubricants can be figuratively "worth their weight in gold," a good lubricant that shines up the bearing, providing always a low friction seat, will in a short time show enormous, unbelievable savings of power; and power-saving means money-saving. This briefly is the record of Xylite greases and oils.

Xylite Fibre Greases are the purest of lubricants, being compounded from the oils of mineral, animal and vegetable and contain no ingredients that are in any way injurious to the journals or bearings.

Their use on the journal forms a fine hard enamel coating, as bright as silver and smooth as glass, reducing the friction to the lowest minimum, and effecting a great saving in horse power. Being of a fibrous consistency these greases adapt themselves immediately to conditions of heat and cold; and while they stand extreme heat without evaporation or waste, it is impossible to revolve a perfectly cold journal against this grease without thoroly coating the journal with the lubricant.

Another advantage of this grease is, it works automatically and supplies greater or smaller quantities of lubrication to the journals as required. If a heavy load or too tight a belt causes a journal to "heat up," the additional heat causes the Xylite grease to feed a little faster, which automatically takes care of the bearing and cools it down; in fact, there never has been a case of a fire from a hot journal where Xylite is used for lubricating the bearings.

They are particularly adapted for clay plant use.

The Carbide Paint used to fireproof wood and protect metal from corrosion, has been added to the line of products manufactured by the G. B. Stock Xylite Grease and Oil Company of Port Huron, Mich.; this paint was formerly furnished to clay plants by E. R. Stowell.

Rail Service

As announced in a previous issue of "Brick and Clay Record," the Buckeye Rolling Mill Company of Steubenville, Ohio, has consistently refused to accept war orders but has adhered firmly to its policy of serving only domestic customers, believing that such a policy of service would be appreciated.

The clayworkers have in only a few cases been compelled to wait on their rail orders; most shipments have been made promptly.

Such a modern idea of service is making firm friends for the Buckeye people, and these friendships are bound to last long after the war ends.

Service rules.

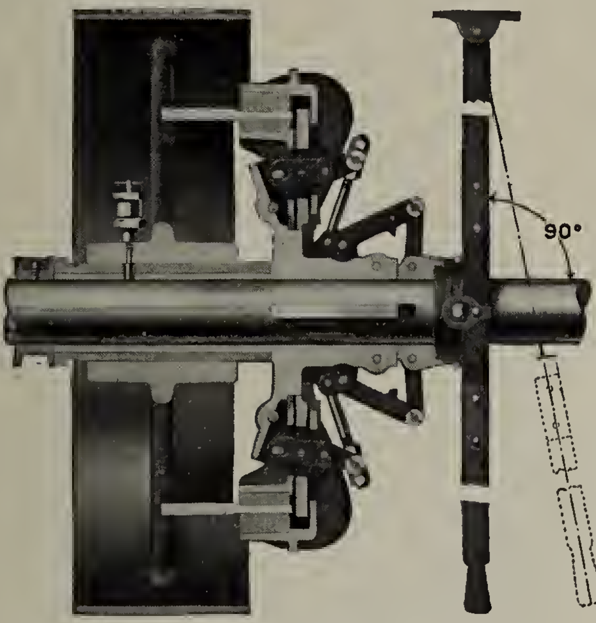
Fuel Economy

A statement that challenges—"We will guarantee a saving in fuel. We will furnish data, testimonials, descriptions and a treatise on fuel combustion." It is made by The Grateless Furnace Company, of Des Moines, Iowa, and the last part of the statement should be accepted by you at once.

Clutches

Can you name a single machine or a single piece of auxiliary equipment that gives more trouble than clutches?

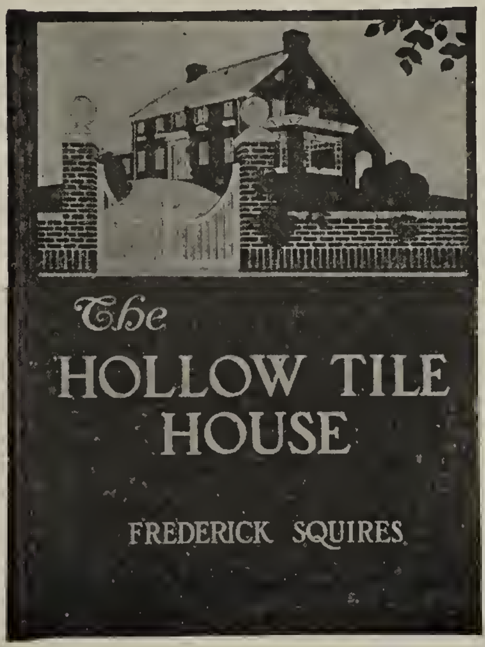
A clutch that slips, burns and breaks can and does give the superintendent more "under capacity" reports than any other one thing.



Hill Friction Clutch Pulley

A light, poorly designed clutch on the auger, pug-mill, dry-pan or similar machine is simply a promise of delay and expense, due to the heavy and intermittent loads that it is required to transmit.

If you make, sell or use Burned Clay Fireproofing



The
HOLLOW TILE
HOUSE
FREDERICK SQUIRES

You Need This Book

THE HOLLOW TILE HOUSE

by Frederick Squires

is brim full of valuable information and good reading matter on this new field of hollow tile in residential construction, its history, how the tile is laid up, cost data and a host of other interesting subjects, all of which is skilfully woven by the author into a very fascinating story. A large number of illustrations give the reader an idea of the architectural beauties and possibilities of the hollow tile house. It will be time well invested to read this book.

ORDER A COPY NOW.

PRICE $2.50

Book Department

Brick and Clay Record
CHICAGO

"Say I saw it in" Brick and Clay Record

Machinery and Equipment Manufacturers and Representatives

While this list is not complete, it contains the names of those who have definitely reported to us that they will be there to greet you. There will be many others besides these—if you are looking for someone you can't find, come to "Brick and Clay Record's" headquarters, Room 341 Statler Hotel, and we'll help you.

ALLIANCE BRICK CO., ROOM 532; F. A. Hoiles.

CLEVELAND ALLOYS CO.; Bernard Bigsby, Jr., E. J. Mellen.

BEIGHLEE ELECTRIC CO., ROOM 327; W. H. Chappel, W. H. Gibb.

BOSS, JOHN C., CO., ROOMS 224 AND 226.

BROWN INSTRUMENT CO., ROOM 339; J. P. Goheen, J. W. Lazear, G. L. Clapper.

BONNOT CO., ROOMS 542-547-549; A. A. Oldham.

CANTON GRATE CO.; E. E. Miller.

CERAMIC SUPPLY & CONSTRUCTION CO., ROOM 1034; W. D. Richardson and H. C. Arnold.

CHAMBERS BROTHERS CO.; J. H. Chambers, A. R. Root.

CHASE FOUNDRY & MFG. CO., ROOM 312; A. J. Dunn, H. S. Swinehart.

ELWELL-PARKER ELECTRIC CO., C. B. Cook, at Phone Prospect 2520 or Space 54. Complete Building Show.

ENGELHARD CO., CHAS., ROOM 346; R. W. Newcomb.

FATE, J. D., CO., ROOMS 343 AND 345; H. H. Fate, G. B. Drennan, H. R. Sykes, H. J. Votaw, G. A. Anderson.

FREESE, E. M., CO., ROOMS 441-443-445; H. H. Freese, A. J. Freese, B. E. Place, R. A. Whiston, E. W. Dow, G. R. Hess, E. L. Hess.

HARDINGE BROS., INC., ROOM 325.

HOOK PATENT KILN CO., ROOM 325; H. P. Jenks.

LAKEWOOD ENGINEERING CO., ROOM 329; C. F. Lang, L. R. Wilson, J. H. Mosel, W. A. Meddick.

LINK-BELT CO., ROOM 331; Paul V. Wheeler.

MANUFACTURERS EQUIPMENT CO., ROOM 306; J. T. Underwood, I. M. Justice, Geo. W. Nushaw, J. C. Harris, W. H. Sachs, E. M. Mahlmeister, J. L. Schroll.

MARION STEAM SHOVEL CO.; F. H. King.

PHILADELPHIA TEXTILE MACHINERY CO., ROOMS 350-352; E. B. Ayres, Harold Copping, Raymond Keiser.

SANDERSON-CYCLONE DRILL CO.; R. R. Sanderson.

SCANDINAVIA BELTING CO., ROOM 342; E. W. Kingsbury, J. W. Cushing.

SCHAFFER ENGINEERING & EQUIPMENT CO.; J. C. Schaffer, W. Crow.

SMITH CO., CLAUDE; Claude Smith.

STEVENSON CO., ROOM 443; C. G. Stevenson, Thomas A. Hibbens.

THEW AUTOMATIC SHOVEL CO., ROOM 431; D. D. Deeds. Also Space 111 at Complete Building Show.

THWING INSTRUMENT CO., ROOM 344; Dr. C. B. Thwing.

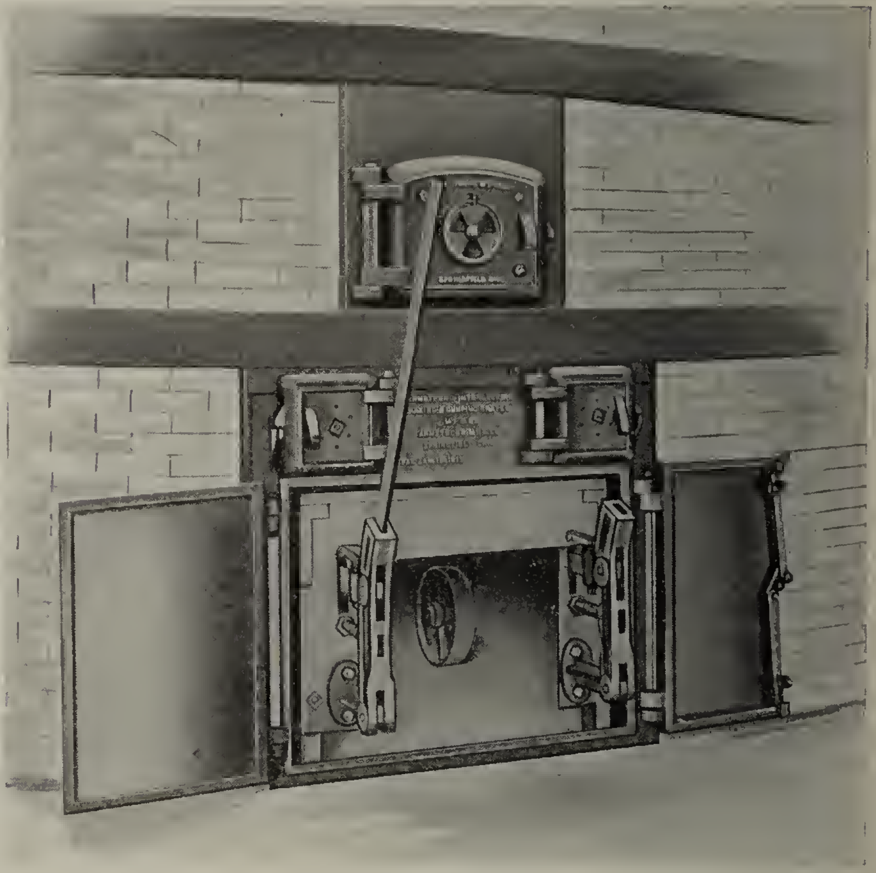
TRAUTWEIN DRYER & ENGINEERING CO; J. Otto Trautwein.

WELLINGTON MACHINE CO., ROOM 324; H. S. Bennett, Roy Bennett, D. J. Strickland.

YOUNGSTOWN STEEL CAR CO., ROOM 810; L. C. Wilkoff.

Hill clutches are designed for the job they are to hold. The different parts are designed correctly for strength, the principle of action is correct, and the clutch is accessible for quick adjustment.

These clutches can usually be fitted and designed for machines already installed where the original clutch has been designed too light to accomplish the necessary work.

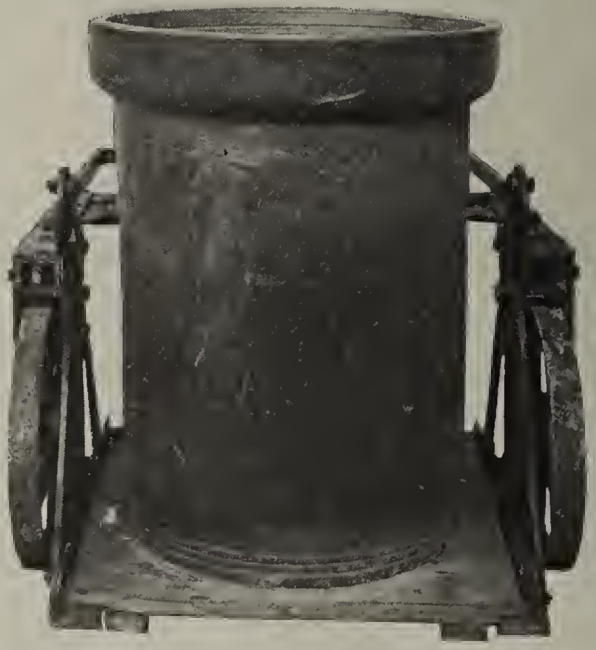


Armstrong Grate

A New Sewer Pipe Truck

A new buggy for trucking green sewer-pipe has been designed and patented by The Toronto Foundry and Machine Co. of Toronto, Ohio. As shown in the cut, it is radically different from the usual, and all changes are producing a more efficient truck.

It takes up but one-half the floor space occupied by the old style truck; the loading and unloading of the pipe is independent of the movement of the truck, therefore no balancing or bearing down on the handles when the truck is in motion; the caster wheel in the rear allows the truck to turn in its own floor space, and this comes in very handy on the elevator.



Toronto Sewer Pipe Truck

It is built of steel and altogether it makes a splendid piece of equipment.

An Unusual Opportunity

The Armstrong Manufacturing Company, of Springfield, Ohio, is making a free trial offer to brickmakers on its Portable Kiln Grate. See the illustration on opposite page, and write the company for details.

The "Railroad" Kiln Booklet

A complete digest of the Didier-March continuous tunnel kiln in pamphlet form is waiting in Perth Amboy, N. J.,—waiting for you to send in a request for your copy.

The booklet is satisfying to the skeptical, to the people who find it hard to believe that the principles of the kiln can be applied practically and actually.

In photographs it shows the kiln construction, the cars, the setting and the ware to be burned, which includes not only brick but also large fire-clay shapes, metal lath and higher grade ware.

Will you have your copy of the "Railroad" kiln booklet now—or does your competitor read your literature for you?

Burned Clay Rugs

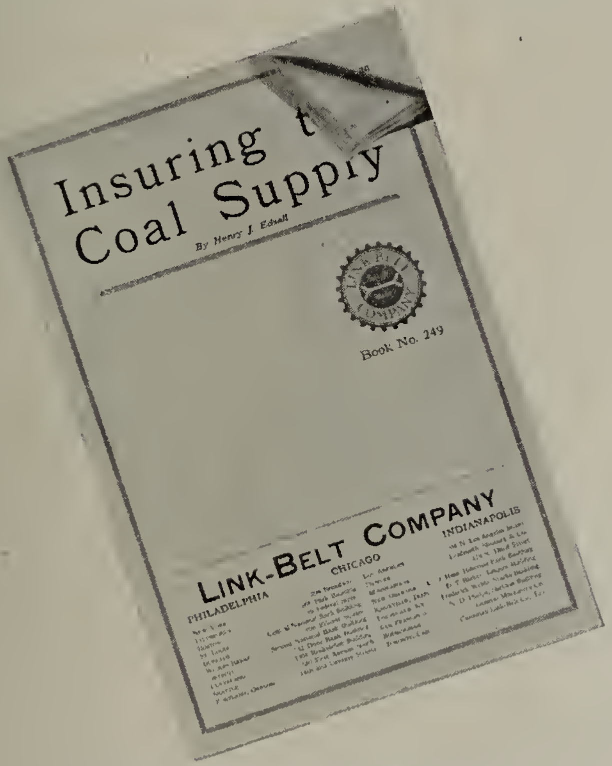
The Alliance Brick Company of Alliance, Ohio, of which F. A. Hoiles is president and general manager, has in this issue a color insert, reproducing almost exactly the color and texture of Alliance Rugs.

It is an impossibility to reproduce the life and color tones perfectly, but on the other hand the plates do not exaggerate in any manner the actual product.

Insuring the Coal Supply

The storage of coal is insurance against both expensive fuel prices and a shut down. Certain precautions must be taken in stocking bituminous coal, and the means to be employed vary widely with circumstances—each installation being a separate problem.

In a 24-page pamphlet, the Link Belt Company, Chicago, offer for free distribution a complete text book on the storage of fuel. The photographs and drawings are accompanied by a plain, concise argument that gives to the whole work a readability and value not always found in technical or descriptive pamphlets.



Insuring t
Coal Supply
By Henry J. Edsall

Book No. 249

LINK-BELT COMPANY
PHILADELPHIA CHICAGO INDIANAPOLIS

Facsimile of the Link-Belt Booklet

Supply Your Engineer with Money-Saving Mechanical Rubber Goods

Help your engineer and other mechanics to get the highest results at the least cost. Here are "first aids" to maximum efficiency at minimum expense—service considered.

P.P.P. Rod Packing
Reg. U. S. Pat. Off.

Ebonite Sheet Packing

Hercules Conveyor Belt

Ebonite Pump Valves

Our 1916 Catalogue, 180 pages, profusely illustrated, is just off the press, and should be in the hands of every live-wire brick or clay plant superintendent.

This is an expensive book, and we want it to go only to the right man—you, the superintendent or owner, therefore please use your company's letterhead when you write—"Send me my copy of your Catalogue."

QUAKER CITY RUBBER CO.

PHILADELPHIA
629 Market Street

CHICAGO
182 West Lake Street

PITTSBURGH
211 Wood St.

NEW YORK
207 Fulton Street

SAY I SAW IT IN BRICK AND CLAY RECORD

SPECIAL FEATURE ARTICLES

THE BLACK DIAMOND

Vol. 5.. No. 9. CHICAGO AUGUST .., 1915. NEW YORK. $3.00 Per Year.

What we do to help dealers in advertising and selling VULCAN COKE

Atwill-Makemson Coal & Coke Company

Practically all Coal Miner's Wage Agreements Expire April 1.

Your future supply of coal depends on the outcome of negotiations, which will begin at Mobile, Ala., February seventh.

For first-hand information concerning this Wage Controversy and its bearing upon your business, become a regular reader of THE BLACK DIAMOND as so many clay product manufacturers already are. Each week's issue contains a vast amount of news of vital interest and importance to you.

Costs but $3.00 a year, 52 issues

THE BLACK DIAMOND

"The coal trade's leading journal"

CHICAGO

New York Cincinnati Pittsburgh

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Broderick & Bascom Rope Co.
Ambursen Co.

Asbestos Roofings.
Johns-Manville Co., H. W.

Automobile Trucks.
Armleder Co., The O.
Federal Motor Truck Co.
Kissel Motor Car Co.

Babbitt Metal.
Cleveland Alloys Co.
Gerlock, H. W.

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Fate Co., The J. D.
Manufacturers Equipment Co.
Toronto Fdry., & Machine Co.

Barytes, Carbonate of.
Gabriel & Schall.
Roessler Hasslacher Chem. Co.

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Main Belting Co.
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Quaker City Rubber Co.
Sawyer Belting Co.
Scandinavia Belting Co.

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Link-Belt Co.
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Manufacturers Equipment Co.
Scandinavia Belting Co.
Weller Mfg. Co.

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Crescent Belt Fastener Co.

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Blowers.
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Manufacturers Equipment Co.
Trautwein Dryer & Eng. Co.

Boilers.
(See Engines and Boilers.)

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Mathews Gravity Carrier Co.

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Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Chicago Brick Machy. Co.
Illinois Supply & Cons. Co.

Brick Machines (Soft Mud).
Eastern Machy. Co.
Manufacturers Equipment Co.

Brick Machines (Stiff Mud).
Chambers Bros. Co.
Fate Co., The J. D.

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Chambers Bros. Co.
Fate Co., The J. D.
Louisville Machine Co.
Manufacturers Equipment Co.
Marion Mach. Fdy. & Sup. Co.
Schaffer Eng. & Eq. Co.

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Clearfield Machine Shops.
Link-Belt Co.
Weller Mfg. Co.

Clay Plants Complete.
Atlas Car & Mfg. Co.
Chambers Bros. Co.
Gerlock, H. W.
Manufacturers Equipment Co.
Trautwein Dryer & Eng. Co.
Weller Mfg. Co.

Clutches (Friction).
Chambers Bros. Co.
Hill Clutch Co.
Link-Belt Co.
Schultz & Son, A. L.
Weller Mfg. Co.

Contracting Engineers and Machinists.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Manufacturers Equipment Co.
Smith Co., Claude.

Conveying Machinery.
Chambers Bros. Co.
Link-Belt Co.
Mathews Gravity Carrier Co.
Weller Mfg. Co.
Scandinavia Belting Co.

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Crushers.
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Chicago Brick Machinery Co.
Fate Co., The J. D.
Manufacturers Equipment Co.

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Crawford & McCrimmon Co.
Fate Co., The J. D.
Manufacturers Equipment Co.
Marion M., Fdry. & Sup. Co.

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Webb Wire Works.

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Fate Co., The J. D.
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Dry Kiln Door Carrier Co.

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Sanderson-Cyclone Drill Co.

Dryer Cars.
(See Cars.)

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Philadelphia Textile Machy. Co.
Standard Dry Kiln Co.
Trautwein Dryer & Eng. Co.
Wilson, Thomas M.

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Chicago Brick Machy. Co.
Eagle Iron Works.
Fate Co., The J. D.
Jackson & Church Co.
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Westinghouse Elec. & Mfg. Co.

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Link-Belt Co.
Marion Steam Shovel Co.
Thew Automatic Shovel Co.

Electrical Furnaces.
Engelhard, Chas.

Electrical Instruments.
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Engelhard, Chas.
Taylor Instrument Companies.

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Chambers Bros. Co.
Fate Co., The J. D.
Gandy Belting Co.
Link-Belt Co.
Louisville Machine Co.
Main Belting Co.
Manufacturers Equipment Co.
Mathews Gravity Carrier Co.
Toronto Fdry. & Machine Co.
Weller Mfg. Co.

Engineers.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Link-Belt Co.
Manufacturers Equipment Co.
Schaffer Eng. & Eq. Co.
Smith Co., Claude.
Trautwein Dryer & Eng. Co.

Engines (Gas).
Bruce-Macbeth Engine Co.

Engines and Boilers.
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Jackson & Church Co.
Manufacturers Equipment Co.
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American Blower Co.
Murray Iron Works Co.
Trautwein Dryer & Eng. Co.

Filter Presses.
Baird Machine & Mfg. Co.

Flexible Shaft.
Bruce-Macbeth Engine Co.

Flower Pot Machinery.
Baird Machine & Mfg. Co.

Flue Blowers.
Marion Mach. Fy. & Sup. Co.

Frogs and Switches.
Atlas Car & Mfg. Co.
Buckeye Rolling Mill Co.
Cincinnati Frog & Switch Co.
Toronto Fdry. & Machine Co.

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Trautwein Dryer & Eng. Co.
Smith Co., Claude.

Gasoline Shovels.
Marion Steam Shovel Co.
Thew Automatic Shovel Co.

Gears.
Baird Machine & Mfg. Co.
Chambers Bros. Co.
Link-Belt Co.
Manufacturers Equipment Co
Nuttall Co., R. D.
Schultz & Son, A. L.
Toronto Fdry. & Machine Co.
Weller Mfg. Co.

Grates and Grate Bars.
Armstrong Mfg. Co.
Canton Grate Co.
Chambers Bros. Co.
Chicago Brick Machy. Co.
Cyclone Grate Bar Co.
Fate Co., The J. D.
Gerlock, H. W.
Jackson & Church Co.
Manufacturers Equipment Co.
Marion Machine, Fdry. & Sup Co.
Martin Grate Co.
Murray Iron Wks. Co.
Smith Co., Claude.
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Gravity Carrier.
Mathews Gravity Carrier Co.

Grease.
Stock Xylite Grease & Oil Co.

High Temperature Cements.
Johns-Manville Co., H. W.

Hoists.
Chambers Bros. Co.
Fate Co., The J. D.
Link-Belt Co.
Manufacturers Equipment Co.
Weller Mfg. Co.

Hollow Block Machinery.
Chambers Bros. Co.
Fate Co., The J. D.
Manufacturers Equipment Co.

Hygrometers or Moisture Indicators.
Taylor Instrument Companies.

Kilns.
American Dressler Tunnel Kilns, Inc.
Chambers Bros. Co.
Didier-March Co.
Boss Co., J. C.
Ceramic Supply & Cons. Co.
Fate Co., The J. D.
Grateless Furnace Co.
Hook Patent Kiln Co.
Illinois Supply & Cons. Co.
Manufacturers Equipment Co.
McManigal Grateless Furnace Co.
Ohio Kiln Co.
Schaffer Eng. & Eq. Co., The
Smith Co., Claude.

Kiln Accessories.
Fate Co., The J. D.
Gerlock, H. W.
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Baldwin Locomotive Works.

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Dewey Bros.

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Stock Xylite Grease & Oil Co.

Manganese.
Roessler & Hasslacher Chemical Co.

Mechanical Draft.
Trautwein Dryer & Eng. Co.

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Baird Machine & Mfg. Co.
Gerlock, H. W.
Manufacturers Equipment Co.

Mold Sanders.
Manufacturers Equipment Co.

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Westinghouse El. & Mfg. Co.

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Illinois Supply & Cons. Co.
Weller Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Oil Engines.
Chicago Brick Machy. Co.
Weller Mfg. Co.

Oil Test Instruments.
Taylor Instrument Companies.

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Quaker City Rubber Co.

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Manufacturers Equipment Co.

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Lehigh Portland Cement Co.

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Buckeye Rolling Mill Co.
Cincinnati Frog & Switch Co.
Manufacturers Equipment Co.
Standard Dry Kiln Co., The.

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Fate Co., The J. D.
Toronto Fdry. & Machine Co.

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Link-Belt Co.
Murray Iron Wks. Co.
Taylor Instrument Companies.
Trautwein Dryer & Eng. Co.
Weller Mfg. Co.

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Link-Belt Co.

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Producer Gas Engines.
Bruce-Macbeth Engine Co.

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Productograph Co.

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Fate Co., The J. D.
Manufacturers Equipment Co.
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Pulleys—Cast Iron, Clutch and Wood.
(See Supplies.)

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Manufacturers Equipment Co.

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Sander Instrument Co.
Stupakoff Laboratories.
Taylor Instrument Companies.
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Trautwein Dryer & Eng. Co.

Quartz Glass Articles.
Englehard, Chas.

Rails (Frogs and Switches).
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Buckeye Rolling Mill Co.
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Buckeye Rolling Mill Co.
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Gerlock, H. W.
Manufacturers Equipment Co.
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Rattler.
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Brown Instrument Co.
Ceramic Supply & Cons. Co.
Price Electric Co.
Sander Instrument Co.
Taylor Instrument Companies.

Represses.
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Chicago Brick Machinery Co.

Resistance Thermometers.
Englehard, Chas.

Revolution Indicators.
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Fate Co., The J. D.
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Eagle Iron Works.
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Link-Belt Co.

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Steamers (Clay).
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Brown Instrument Co.
Taylor Instrument Companies.

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Marion Steam Shovel Co.
Osgood Company.
Thew Auto. Shovel Co.

Steel Ties.
Cincinnati Frog & Switch Co.

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Link-Belt Co.

Supplies.
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Eastern Machinery Co.
Manufacturers Equipment Co.
Weller Mfg. Co.

Switches and Frogs.
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Buckeye Rolling Mill Co.
Atlas Car & Mfg. Co.

Tanks.
Kalamazoo Tank & Silo Co.

Thermometers.
Brown Instrument Co.
Ceramic Supply & Cons. Co.
Engelhard, Chas.
Manufacturers Equipment Co.
Standard Dry Kiln Co.
Taylor Instrument Companies.
Thwing Instrument Co.

Tie Plates.
Cincinnati Frog & Switch Co.

Tile Machinery.
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Fate Co., The J. D.
Manufacturers Equipment Co.
Toronto Fdry. & Machine Co.

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Newman Clock Co.

Trade Names Registered
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Trucks (Auto).
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Manufacturers Equipment Co.
Pettigrew Foundry Co.
Standard Dry Kiln Co., The.

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Newman Clock Co.

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Jackson & Church Co.

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(See Barrows and Trucks.)

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A SCIENTIFIC MIXTURE
It REMOVES BOILER SCALE Absolutely
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Serves more people in more ways than any institution of its kind in the world

Free your Kiln from frequent shutdowns

Where excessive kiln temperatures prevail, ordinary fire clay quickly fuses, crumbles and falls out. This leaves the edges of the firebrick unprotected and allows hot gases to enter the pores of the brick and into the joints between the bricks, weakening them and causing the walls to break down.

J-M Heat Treatment

embodying the use of J-M High Temperature Cements No. 31 and No. 32, protects the firebrick against excessive and soaking heat, and the entire setting from uneven temperature stresses which cause cracks, spawls and disintegration.

By employing No. 31 J-M High Temperature Cement as a mortar to set up the firebrick courses, the bricks are bonded together by a cement that resists any range of temperature. It sets up at a comparatively low furnace temperature and maintains this condition up to 3187 deg. F., its fusing point.

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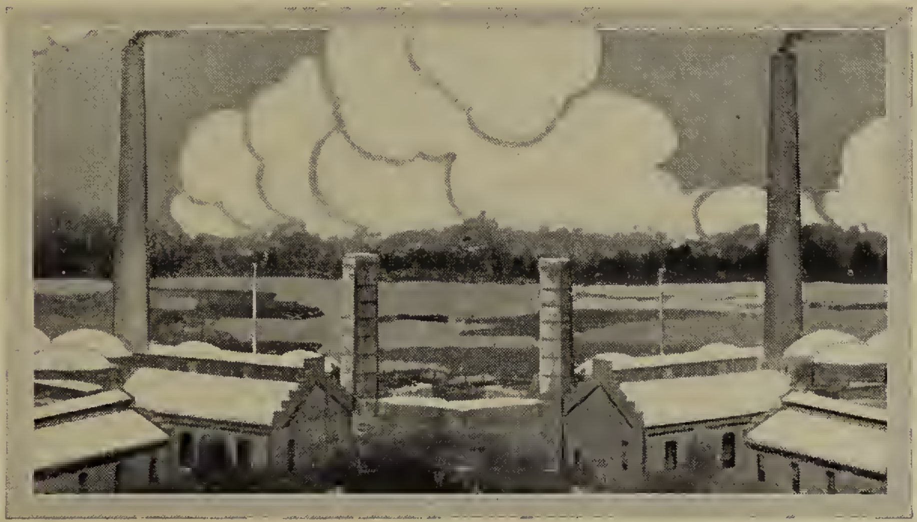
J-M No. 32 High Temperature Cement prevents the influx of damaging kiln gases which injure the china, pottery and glassware during burning.



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MIX RIGHT and Your BRICK WILL BE RIGHT

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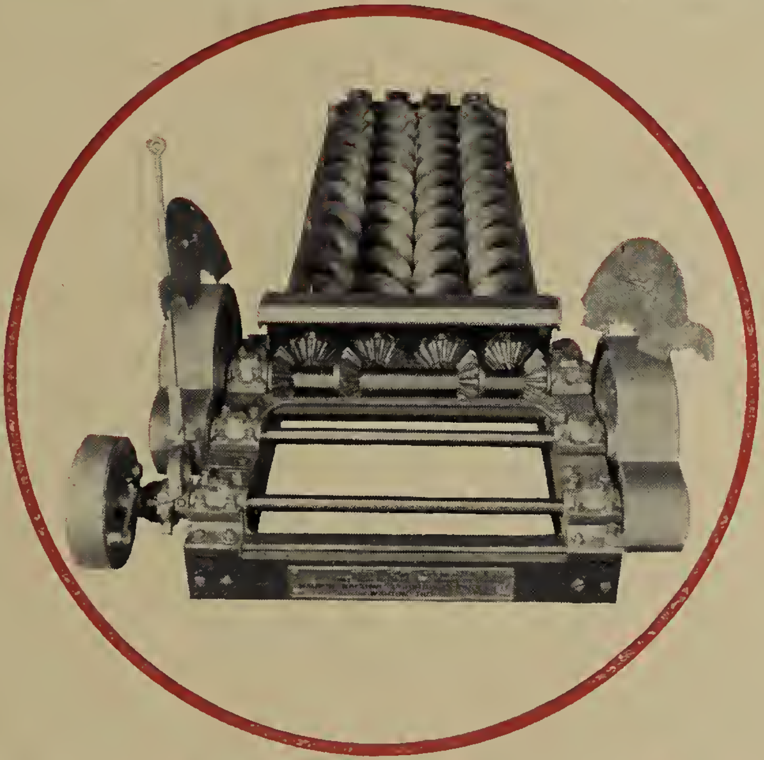

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MIXES AND TEMPERS THE CLAY PERFECTLY.
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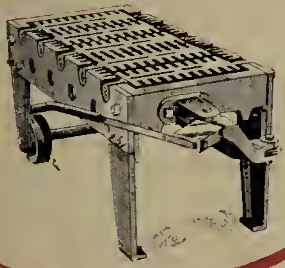

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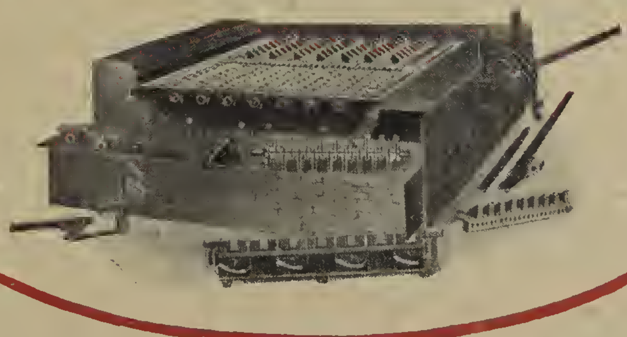

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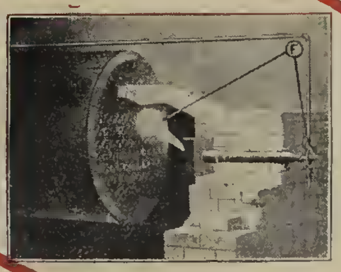

THE MARION SOOT BLOWER

MARION MACHINE FOUNDRY AND SUPPLY CO., P. O. Box 395, MARION INDIANA

Vol. XLVIII, No. 5 Chicago March 7, 1916

WELLER-MADE

WHICH?

Old Style Methods

20 to 25c per ton

To get coal to boiler house and to kilns required two horses, two carts and an average of four men.

For Retail Trade it took wagons or auto trucks from 70 to 90 minutes from time they drove into yard until they weighed out.

Demurrage frequently amounted to from $15.00 to $30.00 per month.

Loss from coal falling between cars and wagons was a serious item.

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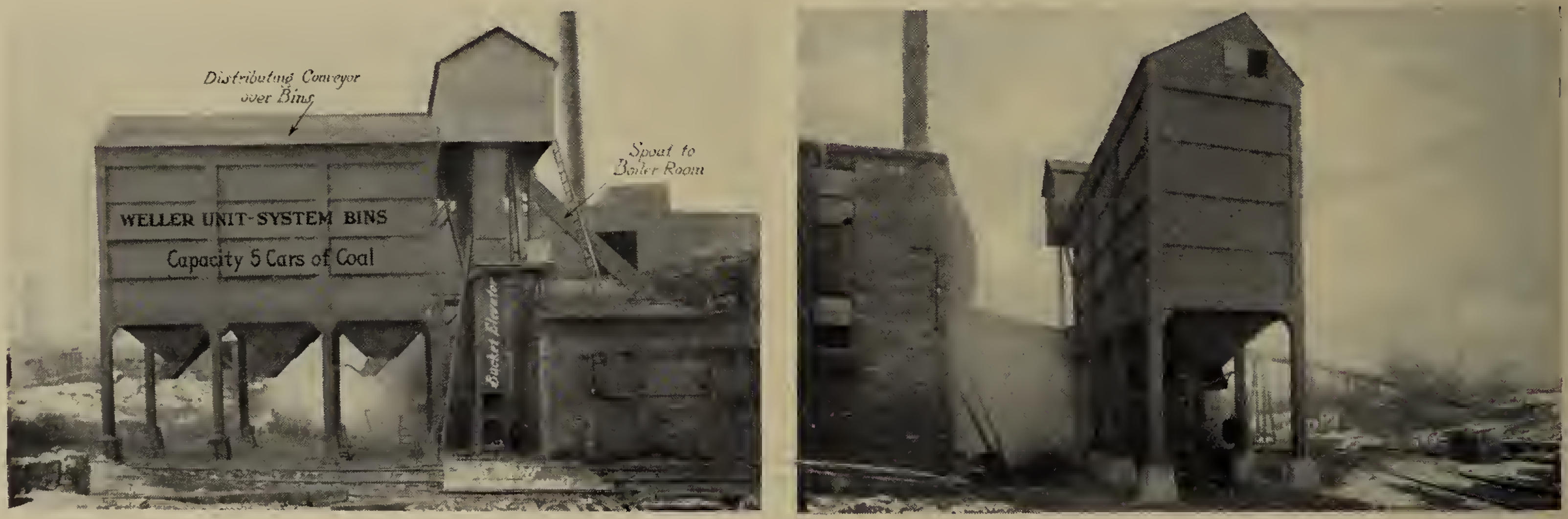
One man, with one horse and cart, supplies all kilns **before noon.** Coal for boiler room is spouted direct, no labor.

Average time regardless of size of load—**10 minutes. Saving one hour.**

Demurrage }
Loss } "Ain't none"
Theft }

Hopper-bottom cars—saving 5c to 10c.

It is up to you to say what your coal handling will cost



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If it is handling coal, clay, shale or other material around your plant we can and will help if given a chance.

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Terms of Subscription
One Year—(24 Numbers)
United States......$2.00 Foreign $3.00
Single Copies.......25c

Published the first and third Tuesdays of each month by

Kenfield-Leach Company
445 Plymouth Court Chicago

Chicago, March 7, 1916

Vol. XLVIII No. 5

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Standards of Practice for Business Publications

The publisher of a business paper should dedicate his best efforts to the cause of Business and Social Service, and to this end should pledge himself: 1. To consider, first, the interests of the subscriber. 2. To subscribe to and work for truth and honesty in all departments. 3. To eliminate, in so far as possible, his personal opinions from his news columns, but to be a leader of thought in his editorial columns, and to make his criticisms constructive. 4. To refuse to publish "puffs," free reading notices or paid "write-ups;" to keep his reading columns independent of advertising considerations, and to measure all news by this standard: "Is it real news?" 5. To decline any advertisement which has a tendency to mislead or which does not conform to business integrity. 6. To solicit subscriptions and advertising solely upon the merits of the publication. 7. To supply advertisers with full information regarding character and extent of circulation, including detailed circulation statements subject to proper and authentic verification. 8. To co-operate with all organizations and individuals engaged in creative advertising work. 9. To avoid unfair competition. 10. To determine what is the highest and largest function of the field which he serves, and then to strive in every legitimate way to promote that function.

The EDITOR'S CORNER

Comment, Criticism and Advice on Live Issues Affecting the Manufacture, Marketing and Manifold Uses of Burned Clay Products

WITH THE CLOSE of the "big" brick convention in Cleveland, the "Open Season for Conventions" is brought to an end for another year. The brickmaker, the manufacturer of hollow-tile, drain-tile and other forms of burned clay now finds himself back at his desk performing his usual tasks, while the hours spent in listening to papers and discussions, and of evenings spent in the reunion of old acquaintances are fast becoming nothing more than pleasant memories.

But now that he is back home and is attending to business, there are some matters that are presenting themselves for serious consideration. Among these is the increasing freight congestion on the Atlantic seaboard and a consequent threatened car shortage of more than ordinary proportions.

In a report made by a Chicago traffic expert recently, which discloses an alarming situation as regards the congestion of freight on the eastern railroads, it was stated that only one of the thru railroads between New York and Chicago had a clear track from lake to tide-water. Furthermore, there are 100,000 cars, loaded to the roofs, backed up on storage tracks between the two cities. With the increase in usual spring domestic business coming on, the car shortage situation will become more acute.

The report states that the congestion is worse at this time than it was three months ago and that there is no probable improvement in sight, despite the railroad embargoes refusing export shipments to the eastern seaboard without evidence of a signed contract for boats to receive the goods immediately upon arrival in New York.

The report coming on the heels of the hearing ordered by the Interstate Commerce Commission in Washington on March 6 and 7, took on added significance. The commission is understood to have investigated the situation privately and has called a meeting with a view to rearranging the embargo rules with the results of the present rules before them. Shippers from all sections are attending the meeting now.

Early reports of the conference disclose the fact that the railroad representatives offered a resolution for the consideration of the commission proposing to cut down the free storage time allowed on freight in terminals, and increase the demurrage charges on cars not unloaded after a fixed period of free time allowed for this purpose. This plan was opposed by shippers and receivers of freight in a resolution declaring it to be their belief that such measures would not relieve congestion but would add burdens to the public.

Who Suffers?

AS IS USUAL in a situation of this kind, the innocent bystander suffers most—manufacturers of burned clay materials being conspicuous among the spectators. While "big business" and the railroads are arguing out their difficulties, the number of cars available for moving commodities for domestic trade is not increasing, and even after remedial measures have been agreed upon, there is little doubt but that the manufacturers of burned clay building materials will have to bear the brunt of the readjustment, in curtailed service and stricter demurrage rulings.

In defense of the railroads, it might be said that ugly rumors are being heard in certain quarters that undue influence is being brought to bear to stimulate the movement of munitions, but these have never been verified.

On the other hand it is stated on good authority, that the railroads have been woefully inefficient in handling the increased traffic, both to the seaports and to interior destinations, failing even after placing embargoes to deliver goods to meet sailing engagements, with the few available ships, thus adding to the congestion.

It looks very much as tho the need of an adequate merchant marine is being well demonstrated and that the mismanagement of the country's carriers in years past is now reaping its crop of wild oats to the detriment of all.

The Model Farmhouse

OCCASIONALLY a rare opportunity presents itself to a state association for doing some really effective work on behalf of the industry which it represents. One of these has come to the Wisconsin Clay Manufacturers' Association in the form of an announcement by Dean H. L. Russel of the College of Agriculture, University of Wisconsin, to the effect that a movement is to be started to erect on the college campus a model farmhouse built of Wisconsin products.

Alive to the situation, Secretary S. Weidman of the Wisconsin association has written to Dean Russel as follows:

"I note from a recent announcement that you are planning to erect a model farmhouse in which nothing but Wisconsin products will be used. A model farm home will be a very useful and instructive addition to the college campus and I hope that you will be successful in carrying out your plans.

"As secretary of the Wisconsin Clay Manufacturers' Association, I wish to call your attention to the fact that Wisconsin brick would be the most suitable building material for the exterior walls of such a model house, not only because brick is fireproof, but because, considering the average life of a building and the cost of upkeep, a brick house is cheaper in the end than one of frame. A model farm home built of Wisconsin buff or red brick, with a mortar joint of Wisconsin magnesia lime, would furnish a much needed and far better example to the farmers of the state, as showing the application of art to homebuilding, than would be if such a home were built of wood.

"Wisconsin brick yards produce a good grade of common-brick with a wide range of colors from white or cream, thru various shades to deep red. Good brick suitable for your purpose could be obtained for from seven to eight dollars per thousand, and if you should select the brick, I think the required amount for a $3,000 house would be furnished gratis from any of the brick yards of Wisconsin."

That further light may be thrown upon the proposed plan of the college, it might be said that the preliminary plans call for a house built of hemlock and trimmed with brick. These plans, are, however, only tentative. The house is intended to be a model of one such as can be erected by the average —not wealthy—farmer. It is to be modern in every respect and will incorporate all of the conveniences of a home in the town or city.

It is gratifying to note that the secretary did not allow his modesty to stand in the way of his good judgment, nor did it stay his hand from writing a letter that is the voice of the manufacturers whom he represents. The advertising possibilities that will be contained in this model farmhouse, if it be built with brick, are not to be despised, and it is hoped that every man who owns a machine for mixing clay in the Badger state will rally to the support of this project.

A Giant Builder

THE FARMER, taken as a whole, is a tremendous builder. Unlike the city man, he does not build only once in a lifetime, but many times, for he requires several structures to carry on his business of supplying other people with the necessities of life.

It is to be regretted that this vast industry—that of turning raw clay into superior building materials—does not fully realize the value of a farmer customer. This is more noticeable in the East than in the West, where large strides have been made toward the building of better farm structures, which means building with burned clay materials.

It is also to be regretted that at least one state has allowed a plan for furnishing of the farmer with a model home similar to that above mentioned, to become one of the chief assets of the lumberman.

A few years ago the state of Minnesota decided that art was a much lacking element in the homes of its citizens. By art is meant the touch of something that is pleasing in the arrangement, the contour and the adornment of the exterior and interior of a home. An art commission was appointed and a competent man employed to assist the citizens of Minnesota in erecting more beautiful homes. After traveling over the state for several months, this architect decided that the farmhouse was in dire need of an injection of the aesthetic, and so with the assistance of several other architects, he prepared some plans for a model farm house to be built of frame.

Several millions of these plans have been distributed, not only in the state of Minnesota, but all over the country, and even abroad. A model of this home stands on the grounds of the state college at Minneapolis, while many others dot the country-side.

It is not only fortunate for the people of Minnesota, but significant of the trend of the times, that this same commission is now taking steps to provide plans for a model, fireproof, built-with-clay-products farmhouse which it will distribute in due time.

Other states are talking of building a model farmhouse on their college grounds. Iowa hopes to do something along this line in the near future. For the safety of their food producers, and as a herald to the advent of both beauty and permanence on the farm, these states can well afford to mark the recent action of the Minnesota State Art Commission and recommend a structure that stands for everything that is good in homebuilding.

The Labor Problem

AS A FORERUNNER to a year of unusual industrial activity, reports of labor shortage are coming from many parts of the country. The Hudson River district and New Jersey are already beginning to feel the lack of sufficient laborers, which threatens not only to curtail production, but to increase its cost.

All of which leads to the need of a better understanding between the employer and the employed.

A drain-tile plant in Iowa has adopted a profit-sharing system which is proving very successful. Not only has it resulted in cementing the workmen's interests to those of their employer, but it also has resulted in a material financial advantage for the clayworker who has adopted the plan.

The usual output of this plant is fifteen hundred tons of ware each month. A bonus is offered for each additional ton manufactured more than that amount, this bonus being distributed among the workmen, according to a well defined plan.

The regular wages are paid to the men when the usual output is not exceeded, but for every ton more than fifteen hundred and up to sixteen hundred, a bonus of twenty-five cents per ton is paid each man, regardless of his position. If from sixteen hundred to eighteen hundred tons of ware are manufactured, the bonus is raised to fifty cents, and to seventy-five cents for every ton over eighteen hundred.

This plan has developed a very efficient corps of workers at this particular plant. Not only that, but because of another feature of this plan whereby each workman's share of the profits for the four winter months commencing with November 1, is held until the following November and then paid with interest (provided the man is still in the employ of the company) this plant has no fear of a labor shortage such as is already beginning to make itself felt at many plants manufacturing burned clay materials.

Time to Act

A WAGE INCREASE of approximately Eight Million Dollars has been won, it is said, by the coal miners of western Pennsylvania, Ohio, Indiana and Illinois.

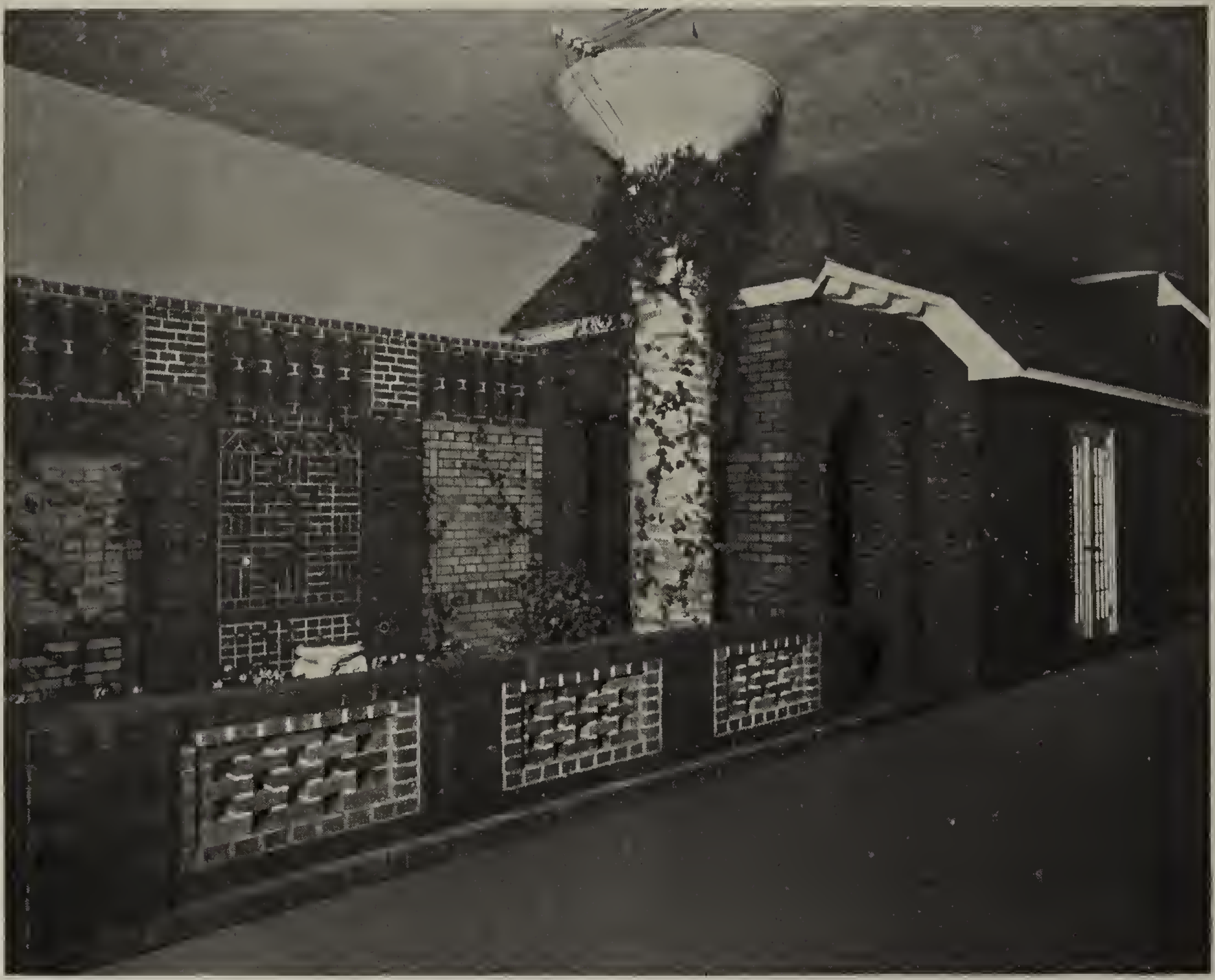
This looks like a lot of money, but when it is considered that there are about 200,000 men to share it, it dwindles to about $40 a year, which will not buy many motor cars, even at bargain prices.

It means however, that the cost of mining the coal that is used on clayworking plants will be advanced something like ten to fifteen cents a ton, with a consequent increased burning cost in every clay product.

Forces over which brickmakers have absolutely no control are constantly at work cutting down the narrow margin between profit and loss.

It is pretty near time that the men who control the output of burned clay building materials gave something more than mere thought to the problem of obtaining a better selling price.

BURNED CLAY *at the*



TWO Face Brick Associations and a Dozen Individual Manufacturers Combined to Make a showing of the Latest Textures in Face Building Brick that was One of the Most Attractive Features at the Complete Building Show Which Was Held in Cleveland in February.

THE FIRST AMERICAN Complete Building Show has passed into history. Its doors closed February 26th, but its influence will be felt for many months to come. Every prediction as to enthusiastic support and public interest was exceeded. As a "business getter" it probably distanced all prior exhibitions of building materials.

To the men who planned the show and whose efforts were untiring, much credit must be given. Cleveland, Ohio, which was the city chosen for the launching of what promises to be a national proposition, was "billed" as for a circus. All ways pointed to the Coliseum and, from the record of attendance, nearly every man, woman and child in Cleveland who had the carfare and the small entrance fee demanded, came under the influence of a wonderful building impetus.

From its very inception, the First American Complete Building Show was destined to be educational. No single building material interest was allowed to overshadow any other and the public was left to judge of the merits claimed by the exhibitors for their various products.

BURNED CLAY WELL REPRESENTED

Unfortunately for brick and hollow-tile, there is no well organized publicity bureau which has either the funds or the experience to take advantage of exceptional advertising opportunities such as were offered by the Complete Building Show. Consequently, it remained for a comparatively small group of face-brick manufacturers to finance the very creditable exhibit that is illustrated in these pages and for a similarly small—even smaller—group of hollow-tile manufacturers to plan, build and pay for the startlingly beautiful exhibit of texture-surfaced tile shown.

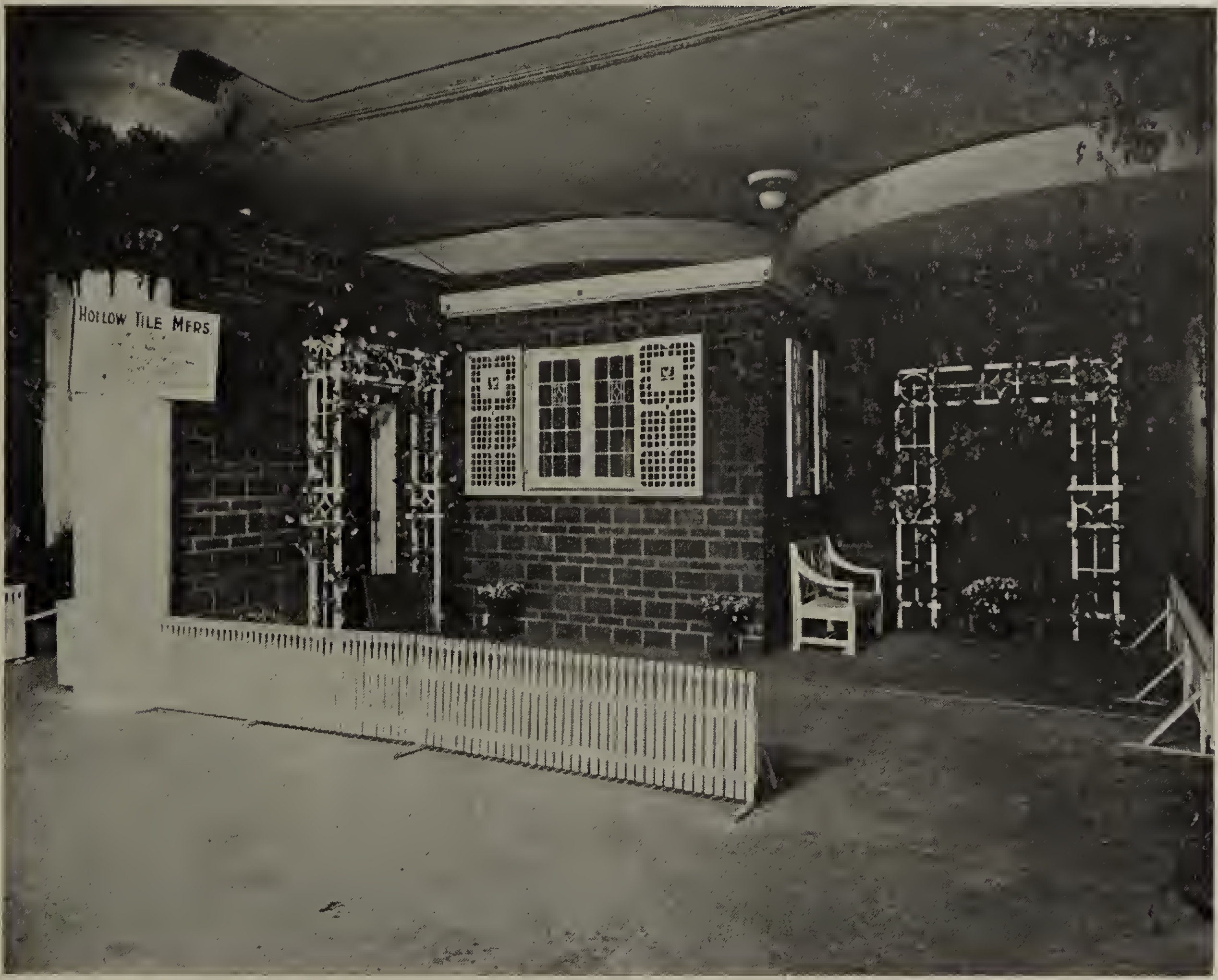
Individual brick manufacturing and selling concerns may be said to have saved the day for brick, since their exhibits, situated at different points in the Coliseum, gave the show a distinct brick "flavor" that it would otherwise have lacked.

Notable among these were the old Dutch kitchen shown by the Farr Brick Company, and the booths of the Cleveland Builders' Supply Company, the Cuyahoga Builders' Supply Company, the Euclid Builders' Supply Company, Kansas Buff Brick and Manufacturing Company, the American Building

The Latticed Entrance Way

COMPLETE BUILDING SHOW

NO Stucco is Needed to Conceal the Surface of the New Texture Tile which Had its First Public Demonstration at the Booth of the Hollow Tile Association. By Roughening the Surface of the Tile, it was Made a Formidable Rival to Face Building Brick



Brick Company, the Barkwill Brick Company and the Lakewood Masons' Supply Company.

Nor must we omit to mention the splendid exhibit made by the National Paving Brick Manufacturers' Association, which consisted of a handsome colonial residence, built of miniature paving brick and approached by a series of winding roads, all laid with vitrified "pavers" about one-and-a-half inches long. To add to the attractiveness of this exhibit a dictaphone apparatus had been installed whereby the men in charge of this part of the exhibit could talk into a telephone transmitter in a tone considerably lower than that which is used in ordinary 'phone conversation, with the result that the passing throng heard a strong verbal presentment of the many economical and attractive features of paving-brick, seemingly issuing from the miniature doorway and windows of the model house.

LUMBER EXHIBITS IMPRESSIVE

It is said that nearly every man and woman is merely a

A Part of the Retail Lumbermen's Exhibit. Here Were Shown Plaster Models of a Number of Attractive Houses, with a Most Complete Scheme of Landscape Gardening

The National Lumbermen's Association Exhibit, in Which a Model Mill-Constructed Factory Building Was Shown

grown-up child and this philosophy seemingly was justified by the interest taken in the exhibit of the Cleveland Board of Lumber Dealers. This exhibit occupied the center of the Coliseum and showed a large horseshoe-like space in which, at set distances apart, were strikingly complete models of frame-built residences representing building values of perhaps ten thousand to twenty-five thousand dollars.

Each of these models was done in plaster and at a cost, we are informed, of three hundred dollars per house. This did not include the very intricate and perfectly executed landscape gardening. Brick walks were interspersed with those built in cement and macadam, miniature flower beds, fountains, ponds, garden statuary, brick walls and wooden fences, all in scale and in keeping with the architecture of the model houses, set off this remarkable exhibit.

A "vote contest" whereby each visitor was asked to sign a slip which gave his or her preference among the houses, was a feature of this part of the exhibit and, since "equal suffrage" was offered, the voting was enthusiastic. Policemen were on duty day and night, keeping the crowd moving in one direction and, while no figures are available at the present time, it was fair to assume that not less than 150,000 votes were cast. One of the models was the prize.

The National Lumber Manufacturers' Association showed a model of a five-story mill constructed building of which three sides were faced with brick, the rear being left open to show approved mill construction. A miniature sprinkling apparatus was installed and the attendants at this booth were kept busy explaining to the passersby that mill construction of this type took the lowest rate of insurance accorded any type of construction for factory purposes—this including reinforced concrete, steel-skeleton-fireproof and solid brick. A great deal of credit is due the men who planned the National Lumber Manufacturers' exhibit for the work done in this booth; it was truly educational and, despite the bitter rivalry of other materials, a spirit of fairness was shown that would have been impossible under other auspices.

The Yellow Pine Association made a strong argument for creosoted-wood blocks as a paving material and as will be noticed in the illustration of this exhibit, had a very strong line of advertising literature. A part of these booklets is shown at the left of the illustration and the sign (which is but partially shown) stated that any or all of the booklets would be sent on request to anyone who might be interested enough to leave an address.

The Redwood Manufacturers' Association had, in the center of its booth, a slab of redwood that was somewhat larger than the top of an ordinary dining-room table. This was in one piece and had been cut directly across the tree. It was polished to a piano finish and if all of the visitors who expressed a wish for a table-top of that kind were to have their longing gratified, it would have made a good sized bare spot in the redwood forests of California.

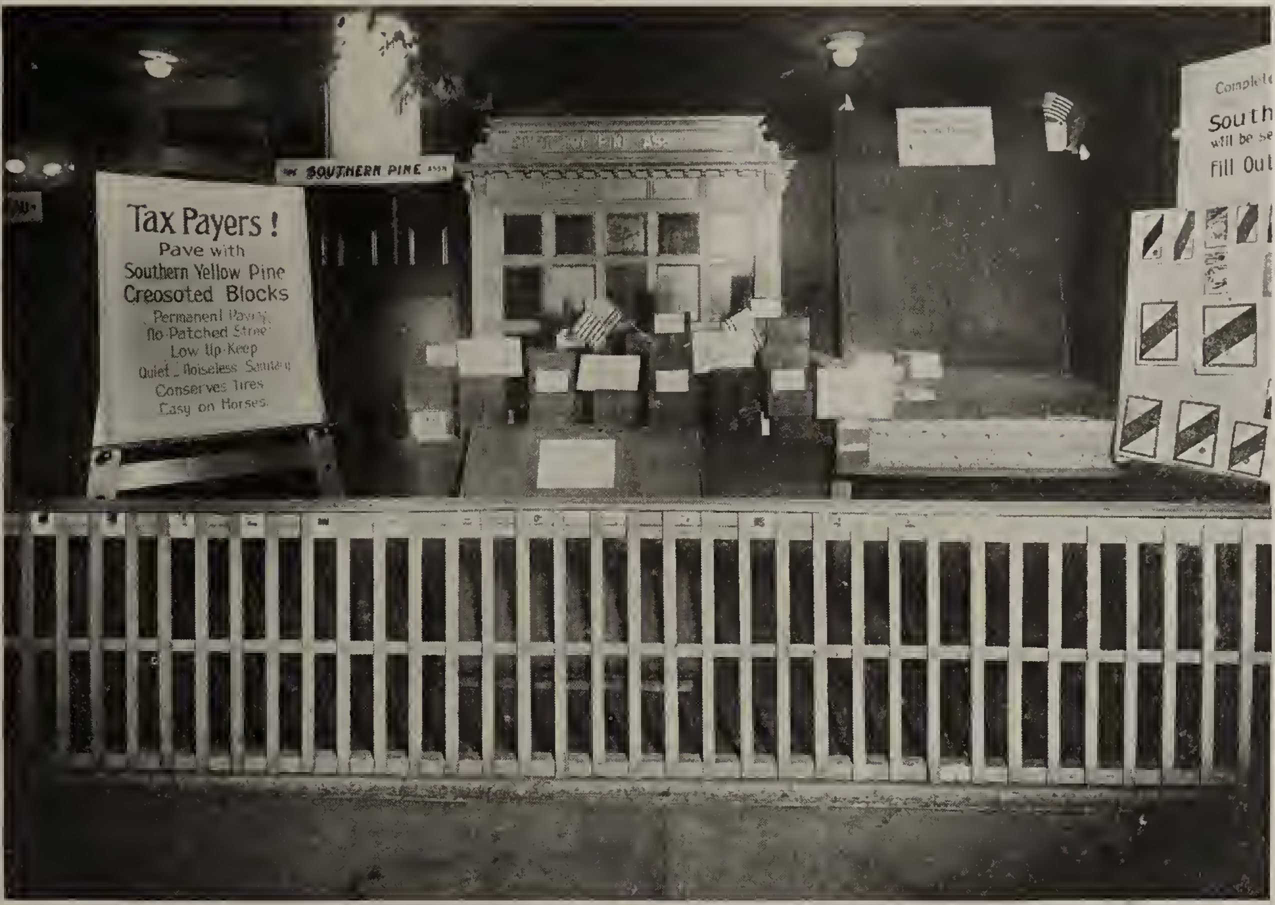
The Seattle Cedar Lumber Manufacturers' Association, the Southern Cypress Manufacturers' Association and the Red Gum Manufacturers' Association all had exhibits that were exceedingly interesting and which appeared to be "doing business" every day and every night, from opening to closing time.

It is particularly noticeable that practically all of these lumber exhibits were financed by associations and this is a thought that should come home with considerable force to manufacturers of brick and other clay products whose "community exhibits" were much fewer in number.

CEMENT INTERESTS REPRESENTED

Despite the fact that almost within the week there had been a cement show in Chicago which covered a floor space that was probably three times as great as that covered by

Clever Lighting Aided the Artistic Design of the Euclid Builders' Supply Company Face Brick Exhibit



The Yellow Pine Association Did Some Good Promotion Work for Creosoted Wood Paving Block

the Complete Building Show, there was enough publicity fever left among the cement companies to put a number of exhibits in Cleveland. All of the large companies were represented, both as contributors to one or more general exhibits and individually.

The Ohio Quarries Company held an audience that must have run into thousands, the week considered, by exhibiting a power-driven machine which turned out stone balusters and other building appurtenances with almost as much ease as tho these huge carvings were being done in the softest of soft wood.

The American Gypsum Company, of Port Clinton, Ohio, the Berger Manufacturing Company, of Canton, Ohio, the Cleveland Cyclone Fence Company, General Fire Extinguisher Company, Murphy Door Bed Company, Whipple Art Glass Company and the Yale & Towne Manufacturing Company were but a few that were especially notable among the many who were represented by interesting and instructive exhibits. Practically every known contrivance designed to increase the comfort of the home had representation.

It is reliably reported that ninety per cent of the practicing architects of Cleveland visited the exposition. In addition to this, it was noted that architects from various other cities were present and exhibitors were unanimous in reporting that an appreciable percentage of those who asked questions as to prices and delivery, were men who were drawing plans for others. The idea that it was an educational show had been thoroly stamped in the minds of the public and, as a consequence, up-to-date men interested either in the designing or building of homes for others, attended what has come to be known as "Cleveland's School for Builders."

BANKS AND BUILDING LOANS

With a view to making hay while the sun shone, one of

Farr Brothers' Old Dutch Kitchen, With Its Family That Might Have Stepped Off of a Delft Plate, Attracted More Attention Than Any Other Individual Exhibit at the Show

Cleveland's most progressive banks fitted up a section of a banking room and saw to it that during banking hours officials competent to pass upon building loans were in attendance. Within a few yards, was a contractor's office in which were men able and willing to make estimates upon the building of complete homes. On the way to these up-to-date facilities for finance, were booths in which plans were sold and building advice given. Thus a man who might be seized with a building fever while attending the First American Complete Building Show, could obtain a plan, secure an estimate and make all of his arrangements for a building loan without leaving the Coliseum.

GARDEN appurtenances were shown in great profusion, and gave some idea of the immense amount of business that is being done in this direction. This pergola was allowed to remain open all during the exhibition and afforded a welcome resting place for visitors.

THE WINNER OF THE PRIZE HOUSE

Probably no other feature of the show attracted quite as much attention as the competition for the fire-safe house that is being built on one of Cleveland's boulevards. As announced in the early advertising, an entirely novel idea was put forward as the basis of the competition. This was, to a certain extent, in the nature of a "guessing contest" in which a cartoon drawn by one of the artists on one of the Cleveland papers was submitted to everyone who attended the show. This cartoon was without a title and it was decided to give the house to the man or woman who suggested a title which would be considered most fitting.

The method of awarding the prize for this house was as follows: First, a score of girls went thru the collection of slips and selected those which appeared to be original and appropriate. From the hundreds of answers selected by the girls, the judges at three session "boiled them down" to a list of about twelve. The vote of the judges upon these twelve resulted in the selection of "The Power Behind the Plans" as being the best answer.

This title was submitted by W. N. Albertson, a draftsman employed in the office of Walker and Weeks, architects, of Cleveland, Ohio. Mr. Albertson owns up to being a bachelor and as a consequence he will have no immediate use for the house unless someone of Cleveland's fairest exercises her right under the Leap Year privilege.

From the figures that have been compiled, the directors of the First American Complete Building Show will be able to turn back to the exhibitors as a dividend from the profits of the enterprise, at least forty per cent of the amount which was paid for the space occupied.

This is in accordance with the early agreement made with exhibitors, which was to the effect that a price for space would be charged which, it was assumed, would take care of all of the expenses of the show. If it were found that the amount so collected exceeded the expenses, then it would be returned to the exhibitors in a ratio proportionate to the amount of paid for floor space occupied by them.

When it is considered that the exhibitors are unanimous in their statements that the show was a great business getter, it seems "to good to be true" that they are to receive so large a rebate on the amount that they have invested.

ANOTHER SHOW PLANNED

There is little doubt but that the Cleveland plan will be followed in a Complete Building Show to be held in 1917. It is suggested that it be held in some city other than Cleveland, and that it be returned to the sixth city in 1918.

The success of next year's show is practically assured, since more than seventy-five of the exhibitors at Cleveland have signed tentative applications for space in next year's exhibit. This does not include any of the S-A-F-E members nor community exhibitors such as the national associations of lumber men, cement manufacturers, etc.

Everyone who has signed one of these applications has asked for at least double the space occupied by them in the Cleveland show. The only reason that the Cleveland people are not going to go right in to provide for a "repeater" is that they think it better to wait until 1918 when the new municipal exposition hall will add to Cleveland's facilities in the line of shows such as the one which has just closed. This exposition hall, it is currently reported, will be the largest in the country, out rivaling the Madison Square Garden in New York and Chicago's far famed Coliseum.

ENTERTAINING *a thousand* CLAYWORKERS

Cleveland Entertainment Committee Assumes Gigantic Task and Acquits Itself With Credit to the Brick Men of America's Sixth City

NO ATTEMPT is made, in this issue, to record the transactions of the National Brick Manufacturers' Convention sessions, nor those of the American Ceramic Society. The articles which follow deal only with the lighter side of the meetings. A full account of the papers read will be found in the March 21 issue.

Reminiscences of the N. B. M. A. "Smoker" and of the Men Who Were Responsible for Its Success

OVERTAXING the hotel facilities of a city long famous for its many and commodious hostelries, the thirtieth annual convention of the National Brick Manufacturers' Association descended upon Cleveland like an invading army. An authority states that the registration at the N. B. M. A. headquarters broke all records—even those of the Chicago conventions of 1912 and 1913, when the Clay Show was in progress.

With it was the annual meeting of the American Ceramic Society, which had so generous an attendance that it ran short of badges early in its daily sessions, altho a number had been provided greatly in excess of the supply of previous years.

Many of the delegates who had come during the previous week, to attend the annual meeting of the National Builder's Supply Association, remained over to meet the brick manufacturers and ceramists, and it was with this unwieldy throng that the entertainment committee of the N. B. M. A. had to contend.

Wisely, we believe, it elected to change the published program in several ways. The one change that made most comment was the leaving of the "ette" off the "smoker," so making it exclusively a session for qualified voters. Ohio has recently gone on record as an anti-woman-suffrage state.

The committee, which consisted of Lawrence B. Koblitz, W. H. Gifford, H. H. MacDonald and John F. Leonard, worked like beavers, both before and during convention week. It started to make itself felt at the opening session of the N. B. M. A., when it brought two magnificent presents into the convention hall, and interrupted the proceedings long enough to put them safely in the hands of the newly elected officers.

It was in evidence at the "Road to Happiness"—a night of entertainment given under the auspices of the National Paving Brick Manufacturers—when the illustrated "talks" were interspersed with song and story, and the eye and ear delighted with some of Cleveland's best musical talent.

Later, and marking the first evening of the N. B. M. A. convention, came the "smoker." The cigars were of real Havana, the cigarettes of real oakum and the entertainers of the real sort. Ladies were barred from the audience, but no such restriction was made in regard to those who stepped upon the platform.

The "smoker" was scheduled for 8 P. M., and promptly at scheduled time, the doors were thrown open. Then came a rush that showed the forehandedness of the brickmen. Realizing the "competition" that was bound to come thru the large number of lumber, cement and asphalt-shingle men in Cleveland, the brickmen lined up outside the door of the Statler ball room, and so gained seats, not only in the front row, but for so many rows back of the bald-head's row, that the lumbermen had little chance.

As they reached the tables, they found that "Brick and Clay Record" was, as usual, a little in the lead. Rubber balloons which, being blown up, disclosed the words "Brick and Clay Record—Your Paper," were at each plate. Soon the air was filled with these light messengers of business journalism, and considerable merriment followed their being "punctured" with the lighted end of the cigars that were so generously distributed.

It is hazardous to guess how much money was spent on the talent, but some idea can be obtained from the fact that an entire "number" was brought from one of the local theatres, which was made up of a well known comedian and a chorus of thirty—mostly "ponies." And this was only one "number" in many that were just as good.

Toward the close of the evening, a light luncheon was served, and the show closed about 11:30, giving the brickmakers plenty of time to discuss the whole affair before seeking repose.

TAKING CARE OF THE LADIES

Nor can it be said that the entertainment committee neglected the fair partners of the joys, sorrows and pocketbooks of the brickmakers. Even tho they denied them admission to the "smoker" they did not leave them—as the saying is—"flat." A free theatre party was arranged for that evening, and they were brought back, fine and smiling, in time to see the break-up of the "smoker."

The day following, they were taken on a trip thru one of Cleveland's most prominent stores, and served with a luncheon that was replete with musical features. The next day (Friday), an automobile trip over Cleveland's fine driveways, and thru a park system of which the city is justly proud, was followed by an afternoon tea and musicale.

AT THE BANQUET

There are some men who like to attend banquets (other than speakers) and some who have banquets thrust upon them. Even the latter kind of man had to admit that where a banquet was "swung" in the way the Cleveland crowd handled this one, this sort of affair was distinctly all right. Not only were the speakers unusually good, but the speeches unusually short. The songs were, in many cases parodies on popular hits of the day, and the suggestion that "all sing" brought out the fact that there are a number of untamed Carusos in the land of clayworking.

Lawrence B. Koblitz and his able compatriots have set a fast pace for future entertainment committees.

CERAMIC SOCIETY *elects* NEW OFFICERS

THE TIME which elasped between the close of the American Ceramic Society's meeting at Cleveland and the date of this issue of "Brick and Clay Record" was so short that it precluded any possibility of a comprehensive write-up on the many happenings of that most interesting event. Suffice it to say that the meetings were conducted by R. R. Hice, of Beaver, Pa., president; R. T. Stull, of Conneaut, O., vice-president; Edward Orton, Jr., of Columbus, Ohio, secretary; Herford Hope, of Beaver Falls, Pa., treasurer, and the trustees, F. W. Walker, of Beaver Falls, Pa.; G. H. Brown, of Pittsburgh, Pa., and H. F. Staley, of Ames, Iowa. The following were elected to office at the close of the meeting and are in service this year:

L. E. Barringer, of Schenectady, N. Y., president; F. K. Pence, of Zanesville, Ohio, vice-president; Edward Orton, Jr., of Columbus, Ohio, secretary; Herford Hope, of Beaver Falls, Pa., treasurer; G. H. Brown, of Pittsburgh, .; H. F. Staley, of Ames, Iowa, and A. F. Hottinger, of Chicago, trustees.

The following were elected to active membership: M. F. Beecher, The Norton Company, Worcester, Mass.; D. E. Humphrey, The Medal Brick Company, Cleveland, Ohio; C. S. Kinnison, "The Brick Maker," Pittsburgh, Pa.; R. J. Montgomery, The H. Koppers Company, Pittsburgh, Pa.; A. Silverman, University of Pittsburgh, Pittsburgh, Pa.; Wilber Stout, Ohio Geological Survey, Columbus, Ohio; Paul Teetor, Kansas Geological Survey, Lawrence, Kans.; A. E. Williams, University of Illinois, Urbana, Ill., and Ira C. Williams, Oregon Bureau of Mines, Corvallis, Ore.

Nine associate members were nominated for promotion to active membership. Their names will be voted on by ballot at the next annual meeting. These men were: Walter A. Denmead, General Electric Company, Research Department, Schenectady, N. Y.; Carl B. Harrop, Ohio State University, Columbus, Ohio; Herbert B. Henderson, Edward Orton Company Pyrometric Cone Factory, Columbus, Ohio; Ercill C. Hill, New York Architectural Terra Cotta Company, Long Island City, N. Y.; W. L. Howard, U. S. Bureau of Standards, Pittsburgh, Pa.; Chas. J. Kirk, Universal Sanitary Manufacturing Company, New Castle, Pa.; Emerison P. Poste, Elyria Enameled Products Company, Elyria, Ohio; J. W. Ward, Pittsburgh High Voltage Insulator Company, Derry, Pa.; F. W. Walker, Jr., Beaver Falls Art Tile Company, Beaver Falls, Pa. An unusually large number of ceramists were elected to associate membership, including two Japanese ceramists.

The total membership February 1, 1916, which is the beginning of the fiscal year, was 510, indicating a gain in membership of 33.

The attendance was one hundred and fifty, which is the highest record for the American Ceramic Society.

Fifty-one papers were read during the sessions, which lasted from February 21 to 24, and sections "Q" were held at intervals.

It is expected that, in the March 21 issue of "Brick and Clay Record" a full account of these meetings and sections will be given, written by one who was constant in his attendance.

THE A. C. S. "TRANSACTIONS"

Members of the American Ceramic Society know all about the "Transactions"—a yearly volume of the papers read at the meetings of this, the most influential ceramist's organization in the world.

A complete set of these volumes (there are seventeen) would give their possessor far and away the most complete line of ceramic data printed in the English language. The cost of the complete set, by the way, is $94.25, if the cloth-bound books are desired.

The most recent volume, of which Arthur S. Watts was the editor, is known as Volume XVII, and has 813 pages, filled to the type margin with valuable matter for everyone interested, even remotely, in any branch of clayworking. It, and the volumes that have preceded it, can be obtained thru "Brick and Clay Record's" Book Department.

CALLING "COST" *by its* REAL NAME

Paving Brick Institute to Hold a Cost Conference Where Extravagant Items Will be Tried and Convicted

By William G. D. Orr

General Manager, The Purington Paving Brick Company

A PROMINENT MANUFACTURER recently remarked, "I believe the paving-brick industry of the country, taken as a whole, is on a losing basis." If this statement be true, we are all responsible, those of us who are—and those of us who are not—making money. This condition can be corrected and must be, if the industry is to continue to occupy the position of prominence it has already attained.

The publicity associations supported by the manufacturers are becoming more efficient each year, but they cannot be expected to make the industry a financial success if we, as manufacturers, hide our heads in the sand like ostriches, and refuse to help ourselves, nor can we support these associations as generously as we should, unless our business is handled at a profit.

The day of price-fixing and its accompanying extravagant methods is past, and the day has come when all industry, to be successful, must be on a proper economic basis.

The Institute of Paving Brick Manufacturers will meet in Portsmouth, Ohio, on April 12. C. C. Blair, secretary and general manager of the Bessemer Limestone Company, will lead a discussion on "Cost Keeping." Men in charge of the cost departments of a number of concerns have signified their intention of attending the meeting and taking part in a frank discussion of this most important subject. If we all knew our exact costs, our selling prices would automatically set themselves. Our competition might still be keen, but it would no longer be ignorant.

Having had the unusual opportunity of examining the cost sheets of most of the larger paving-brick manufacturers, the writer is of the opinion that a comparatively small amount would cover the actual difference in their costs per thousand brick or per ton.

There is a peculiar form of pride possessed by most of us, which makes us rather hide our costs than show them. If there is any one operation or motion in the process of manufacturing paving-brick, which we accomplish cheaper or better than our competitors, we are usually more than willing to tell about it, but our complete cost sheets, as a rule, contain items which we are reluctant to expose. These are usually an occasion for shame rather than pride. Thus we deny ourselves the opportunity of getting the light of reason in on the dark spots of our business economy. If these extravagances were fully talked over, the means of new economies would be found.

It has often been said that every manufacturer of paving-brick losses one dollar per thousand somewhere in his process of manufacture. Do you know where you lose yours? If not, have you any way of finding out where you lose it?

If we all go to Portsmouth with the idea in mind of telling each other a few of our weaknesses, as well as our virtues, it will undoubtedly be a very profitable meeting, and possibly the nucleus of a reform in our cost keeping systems.

Some manufacturers in other lines have gone so far as to adopt uniform cost keeping systems, which have been of inestimable value. At the present time it is almost impossible for two paving-brick manufacturers to get together and compare costs intelligently, as no two keep their accounts in the same way, nor include in them the same items. They cannot both be wholly right, and the chances are that the one showing the lowest cost may be fooling himself, which is known as "kidding on the square."

Mr. Peebles of the Peebles Brick Company, has extended to us a cordial invitation to visit his plant, and it is the desire of the Paving Brick Institute that all members make an earnest effort to be present. The institute extends to those who are not members an invitation to the meeting and urges their participation in the discussion.

Utah Brickmakers Form Association

Brick manufacturers from various parts of the state of Utah met at the Commercial Club in Salt Lake City on February 11, and organized the Utah Clay Products Association.

Immediately after the organization was effected a resolution was adopted standardizing the size of common building brick at 8⅜ inches long, 4 1-6 inches wide and 2⅜ inches thick.

John P. Cahoon of Murray, president of the Salt Lake Pressed Brick Company, was elected president of the association; J. M. Child of the Ogden Pressed Brick and Tile Company, vice-president, and R. H. Siddoway of the Kaysville Brick Company, secretary-treasurer.

L. G. Rose Makes New Connection

L. G. Rose, former secretary of the Northwestern Clay Association and manager of the Minneapolis Clay Brick Company, has severed his connection with the last mentioned concern and has opened offices in the Plymouth building, as Minneapolis representative of the C. H. Klein Brick Company, of Chaska, Minn.

The Chaska plant for the past several years has produced from forty to fifty million common-brick, of which it has sold from eight to twelve million in Minneapolis, the remainder being distributed thruout the Northwest. This year, however, the plant has increased its capacity to sixty million brick, for which it has installed an additional drag-line excavator, radiated heat drier and another brick machine of modern type. The plant is now operating eight machines.

Mr. Rose reports prospects as being good for the sale of common-brick in Minneapolis during the coming season, with stocks somewhat limited.

Oregon Association Closes Successful Year

Having emerged from the creeping stage and fast growing steady upon its feet, the Oregon Clayworkers' Association started the second year of its existence at the annual meeting held in Albany, Ore., February 9 and 10.

To start a new organization is not altogether an easy matter, but to maintain life and to go into the second year is a still greater task. The statement comes from the secretary,

S. Geijsbeek, that the association is making progress. It is making friends with the clayworkers in the Far West, the general feeling being that the members are deriving considerable benefit from its activities.

The attendance was good at the recent convention, considering weather conditions. A business meeting was first on the program. The proposition to carry on an educational advertising campaign in behalf of clay products, which was brought up early last year, was referred back to the board of directors for action. Unfair competition from prison-made brick and drain-tile came in for a lengthy discussion. It was voted to give the president of the association power to appoint a committee to draft a resolution concerning this matter and to present it in person to the governor of the state and to the board of control.

The remaining part of the first day and the evening session were devoted to the reading of various papers. The City Engineer of Albany gave a talk on drainage problems. H. S. Wheeler, manager of the Far West Clay Company, presented a paper on "Hollow-ware Die Construction" which was of considerable interest. Secretary Geijsbeek gave a talk on "Co-operation Among Members," and suggested that the interchange of cost data and operating expenses would be very beneficial to all members.

On the second day the delegates proceeded by rail from Albany to Corvallis, holding the final session of the convention in the Mines Building of the Oregon Agricultural College, which is located at that point. This session was presided over by Prof. H. M. Parks, Director of the Oregon Bureau of Mines and Prof. Ira A. Williams of the Clayworking and Ceramics Department. Prof. Williams read a very instructive paper on the burning of claywares. Other papers were read by Prof. Parks and Prof. Graf. Prof. Powers, secretary of the state drainage association, gave some interesting talks on drain-tile and drainage.

The time and place of the next, or quarterly meeting has not as yet been definitely decided, but will probably be held in June, when the plants at McMinnville and Willamina will, in all probability, be visited.

The following officers were elected for the ensuing year: Harold S. Smith of the Denny-Renton Clay and Coal Company, Portland, president; Phil. Withycombe of the Yamhill Tile Company, vice-president; S. Geijsbeek of Portland, secretary and treasurer.

Allen E. Beals Incorporates

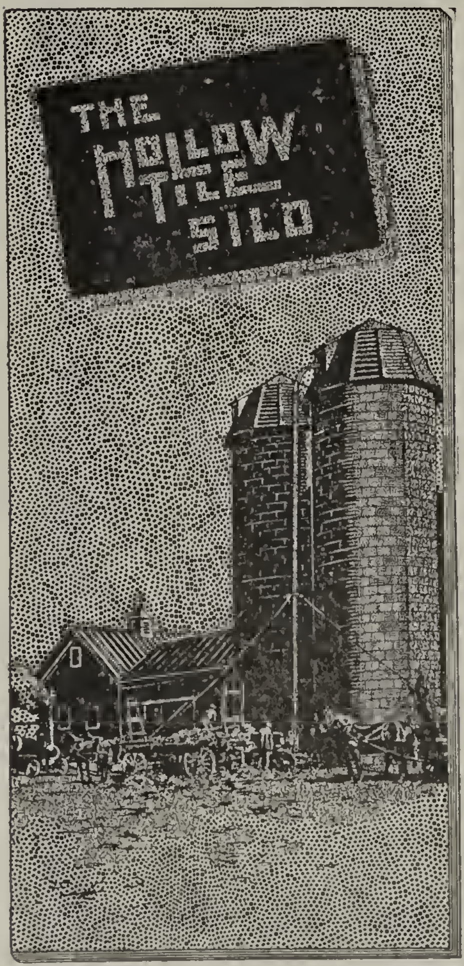
A charter was granted February 28, to the Allen E. Beals Corporation, an organization that will do a general building material news distributing, publishing and advertising business, at 47 West 34th St., New York. The company is capitalized for $5,000, all of which has been paid in by Allen E. Beals, Stephen Gates, Charles Francis, George B. Hill and Ford H. Dow.

Allen E. Beals has long been a contributor to "Brick and Clay Record" and other building material papers. The new company will represent this publication, as well as "Rock Products," the "Mantel, Tile and Grate Monthly," and local papers carrying real estate sections.

A Correction

On page 230 of the Feb. 1 issue of "Brick and Clay Record," the third paragraph from the last, there was a slight error. It was typographical but misleading. The paragraph read: "The brick then get their heaviest heat and the oxides of iron are changed to anhydrous peroxide." This should have read: "de-hydrous peroxid."

A NEW DEPARTURE *in* SERVICE *to our* READERS



The Hollow-Tile Silo Booklet That Is Printed for You

THERE IS LITTLE DOUBT but that the next six or seven months will witness a volume of silo sales, the like of which has never before been known.

A "freakish" summer, in which immature corn crops met early frosts, has pushed the farmer with a silo into the "limelight" as being well equipped to take care of just such a situation, and to get the most out of his crops. The farmer without a silo has bemoaned the fact that he has been compelled to throw away the greater part of his corn because he was unprepared for the emergency. Not only that, but the value of a silo for use at all times, and as a great feed conservator, is becoming better known.

While the number of silos that will be sold this year will probably be all out of proportion to the number sold during 1915, there will be a similarity between these two periods in silo history. It is that an increasing number of wood stave and cement silos are still being erected on the farms of this nation, despite the fact that, in some localities, hollow-tile silos have been built at costs that were lower than cement and no higher than wood.

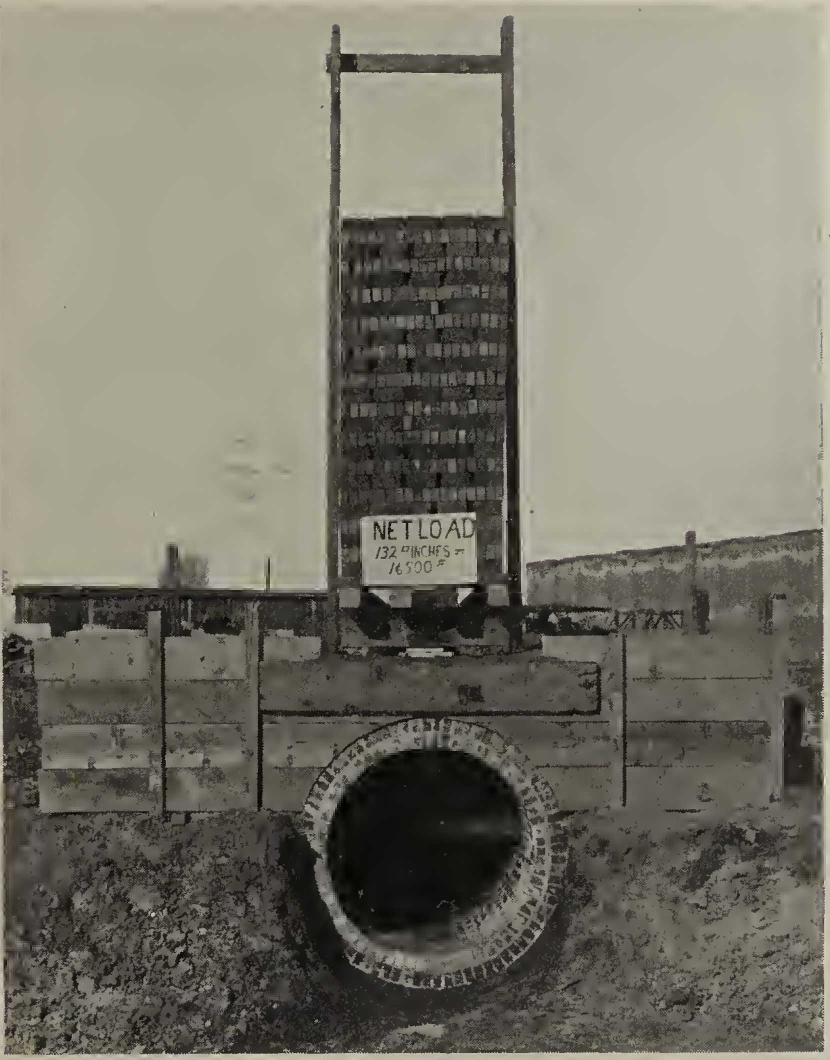
One difficulty has been in the past that most manufacturers lacked good literature which could be distributed cheaply among the farmers, and which carried a strong message for the silo built of burned clay materials.

But this obstacle has now been overcome. A booklet, of which the accompanying illustration is a reproduction, is being printed by this magazine and is available to manufacturers of silo tile at very low prices. The booklet is enclosed in a green cover, on which an attractive design in yellow and black appears. Twenty-four pages of good sales argument well illustrated and to the point make this booklet a valuable sales help.

It measures four inches wide by eight and one-half inches high—just the size to fit into your large envelopes and can be mailed with your letters. There is also space on the back cover where your local printer can insert your advertisement. This booklet is obtainable at the following prices: in lots of 1,000—$25; 500—$15; 300—$12; 200—$9 and 100—$5. Get your booklets early, for now is the time to push silo sales.

ADVERTISING
the strength of
a BRICK SEWER

Showing How a Brickmaker Won Recognition for His Product and a Lot of Free Advertising



CEMENT INTERESTS failed in their endeavor to secure exclusive specifications on fifteen miles of six-inch reinforced concrete sewer, largely thru the activity of a brick manufacturer. It happened in Fresno, Cal., and the story is still sufficiently new to warrant telling.

Incidentally, the brick man succeeded in obtaining considerable publicity in the local papers. One of them, the Fresno "Republican" says, in its issue of February 13, 1916:

"Officials of the county and city, prominent brick manufacturers, contractors and representatives of the local bricklayers' union were present yesterday at a test made in the yards of the Fresno Brick and Tile Works, of a five-foot conduit. The suggestion was made some time ago to the city trustees, supervisors and the city engineer, that a brick outlet sewer would be the solution to the city's sanitary problem. The brick conduit withstood the pressure to be demanded in the specifications. The test was successful.

"Those who witnessed the test made yesterday expressed themselves as being of the opinion that the brick circle would answer the purpose. The test was a generous one. Resting on a piece of wood 132 square inches in size, were bricks weighing 16,500 pounds, a weight greatly in excess of that demanded by the United States government for similar outfalls. The caliper showed no deviation from the original measurements when the blocks supporting the tremendous weight were removed.

"Fresno's present sewer outfall system is pronounced inadequate. The pipes are but 24 inches in diameter. The test made yesterday was on a brick circle, five feet in diameter. Eastern cities have used similar conduits for many years. Several cities have conduits, 7 feet in diameter, with but two layers of brick, set in place with cement.

"No strain was noticed on the circle of brick after the blocks and props were removed yesterday. Brick manufacturers and other experts present at the test yesterday stated that the city will be saved a vast sum."

E. M. Prescott, vice-president of the Fresno (Cal.) Brick and Tile Company, was responsible for the demonstration. He found that, the city being ready to construct fifteen miles of 5-ft. outfall sewer, the cement men became very active in their efforts to secure exclusive specifications covering a 6-ft. reinforced concrete sewer. Believing that something should be done by the brick interests of Fresno, in order that they might be protected, a meeting was arranged at which the owners of all of the brick plants and of representatives of the bricklayers' union came together and arranged to submit a test of a 5-ft. brick sewer, 9-in. in thickness.

The city engineer made the statement that if he could be convinced that a brick sewer would carry a live load of 2 tons to the square foot, he would allow brick to be carried as an alternative in the specifications.

The illustration that accompanies this article shows the simple test that was used in the test. The section of the sewer was built in the edge of a clay bank and a bulkhead constructed so that 18 inches of earth rested over the top of the sewer. This fill was carefully tamped.

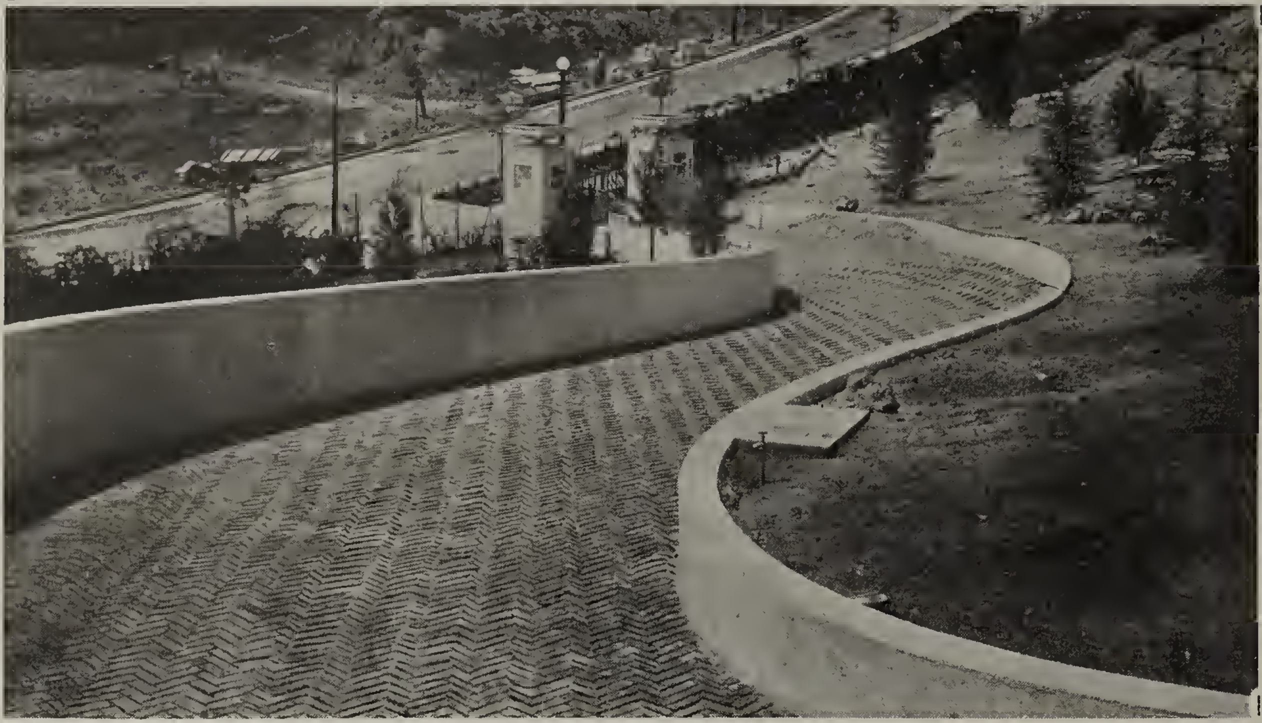
A casing 12-in. square rested directly on top of the arch, with a ½-in. cushion of sand, upon which rested the ram. This consisted, in turn, of a timber 11½ inches square, upon which was constructed a platform measuring 4-ft. square, and carrying 16,500 brick.

This gave a load of 125 lbs. per square inch or nine tons per square foot. The brick used in the construction were good average common-brick. The mortar was one part of Portland cement and two parts sharp sand.

The test was announced to the city officials and civic organizations, and a very representative audience witnessed the placing of the brick load on the platform. In this way, public sentiment was turned in favor of brick and the city trustees instructed the engineer in charge of the specifications to include brick as an alternate.

So much interest was created that two moving picture concerns made films of the test and the crowd that had assembled to witness it, with the result that brick publicity is now competing, without cost to brick manufacturers, with the current feature films shown in the "movie houses" in Fresno and many other cities.

All of which goes to show that there is a sure reward for the brick man who is willing to demonstrate his faith in his product, and who has the wit and foresight to do a little press-agent work when he is ready to "stage" something that is of more than passing interest.



A BRICK Driveway in a Hill Country. The Method of Laying in Herringbone Pattern Adds to the Effectiveness of the Design and Offers a "Skid-Proof" Surface

BRICK DRIVEWAYS

offer new outlet for

BEST PAVING MATERIAL

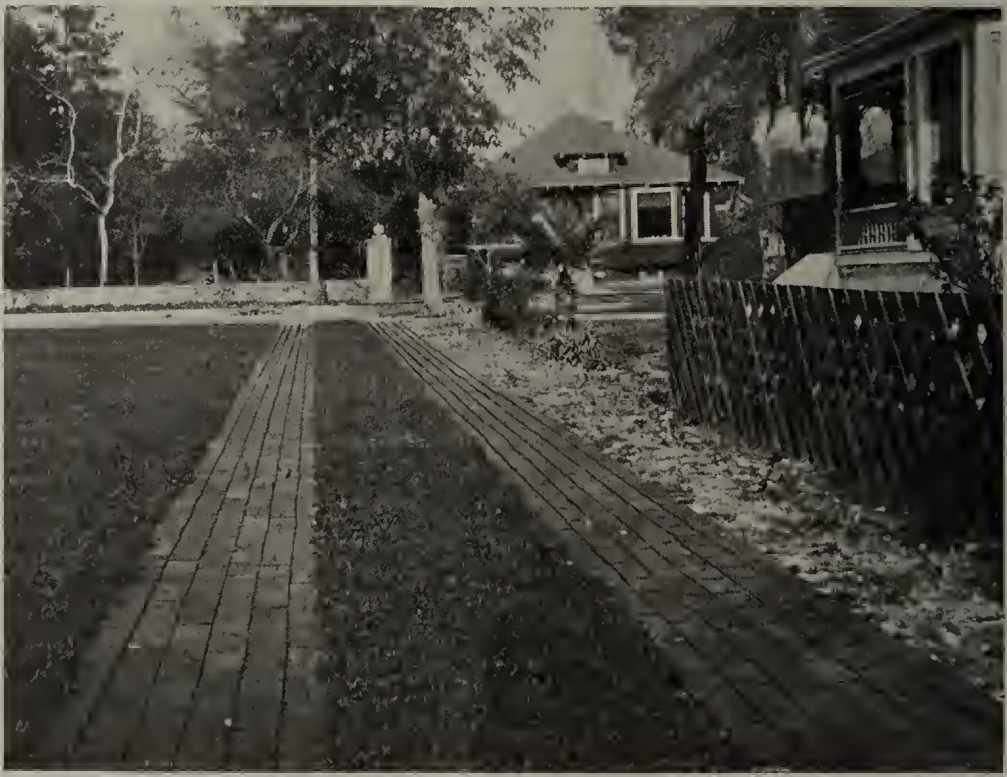
Economy of Upkeep and Artistic Merit of Vitrified Brick Appeal to Builders of Private Roads

IN THIS DAY of the automobile, when men who seem to have hardly any other earthly possession own and operate a motor-car, disputing the right-of-way with those whom a strenuous ex-president called "malefactors of great wealth," there is a growing and insistent demand for better roads.

And following this, comes an individual desire, on the part of the man who guides the car (or the man who pays the man who guides the car) to make the link in the road that lies between the highway and his own home, at least as good as the public road and perhaps a little better. Naturally he turns to brick.

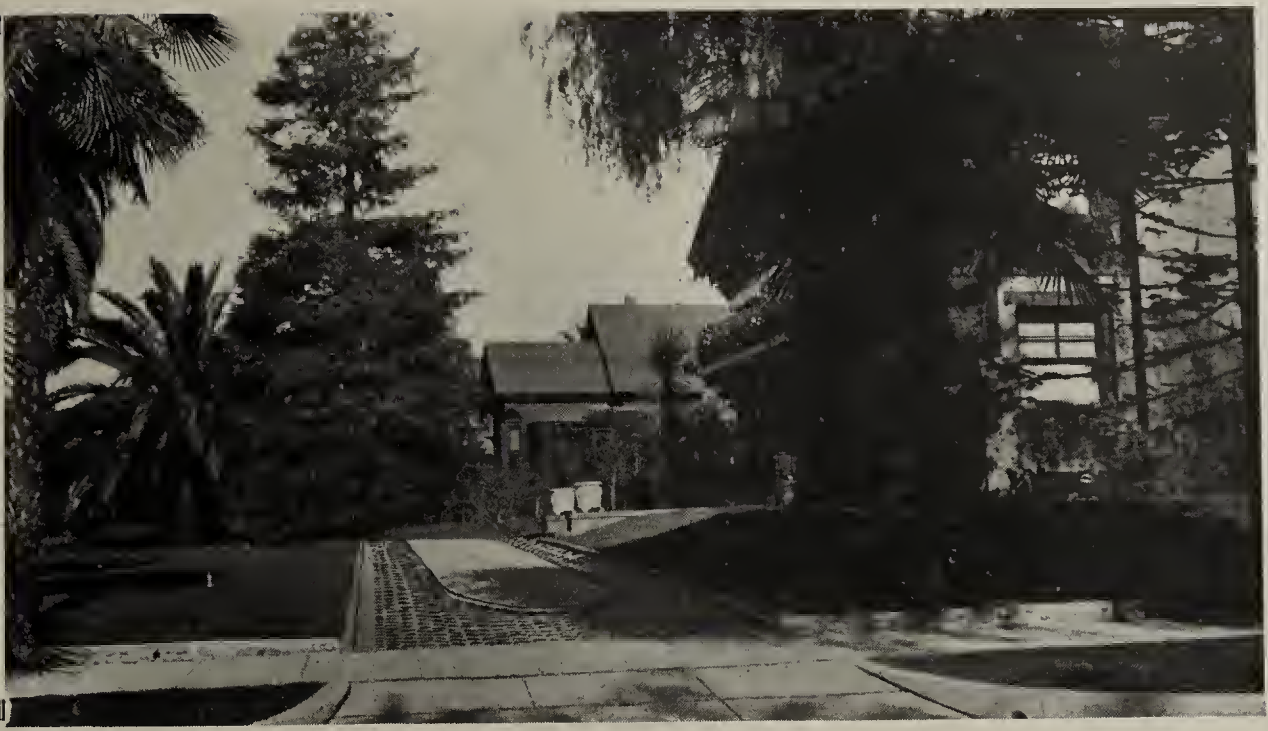
It has not been many years since the private driveway was looked upon as a necessary evil. Before the advent of the motor-car, and when the horse and buggy—or phaeton—was the vogue, it was thought well to "hide the driveway as much as possible." Now, the newer mode of travel has made a change. The slick and shining limousine refuses to sneak around the back way, demanding admittance in a manner more suited to its position in society.

And so, the modern home-builder figures on a driveway that will be in keeping with the house to which it leads. Even tho the builder be only thinking of a car, he will build a road upon which it can come to his door with proper dignity, or he leaves a place whereupon that driveway may be built.



A Two-Strip Driveway in Which the Brick Are Laid Two and Two, Giving Pattern As Well As Color to An Important Detail in the Landscape Architecture

CEMENT is Used Where it is Least Exposed to Wear. The Brick Offers Good Traction to the Rubber Tires of Motor Cars and Contrasts with the Shrubbery.



So, the location for the drive having been settled, the question of worthy surface presents itself. The question of durability has a bearing here, for no public appropriation is available, either for upkeep or cleaning. For that reason, if none other, brick is generally chosen. Its durability has been proved beyond question, and it is a material that can be appropriately used in connection with any dwelling, whether the latter be built to burn—that is, of wood—or of hollow tile, or of brick.

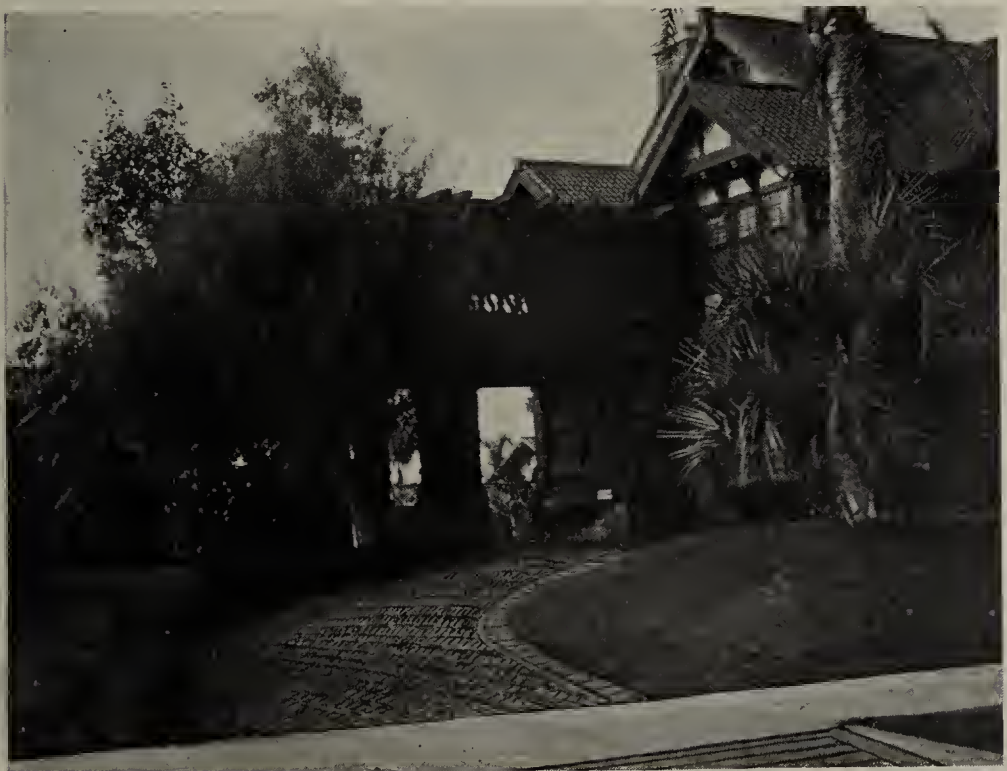
The southern section of California contains many pretty brick features. Among these, the driveways are not the least of importance. Accompanying this story are several suggestions in brick drives gathered in that sunny section. These will give some idea of what is being done in that locality to make the brick driveway "different" and how well the builders are succeeding in their efforts along this line.

There are some points that should be remembered in connection with the building of the brick drive, however, and one of these is that invariably the bed on which the brick are placed must be perfectly solid. If the foundation is unpacked or soft, a brick here and there will be sure to sink, causing an uneven roadway, and detracting from the drive's general appearance. The bed of the drive may be dampened and rolled very firm, and the bricks placed directly upon this or upon a thin layer of screened sand, other sand being worked in between the bricks from the top after they have been laid. Or, after the bed has been rolled a layer of about an inch of concrete may be poured upon it and the bricks laid in this (while it is still soft) or upon it. A mixture of half cement and half sand may be run between the bricks from above, after they are in place, or screened sand may be used in this way.

All of which is well to remember, but equally important is the point of drainage. No matter how well packed the foundation, there is generally a chance, at some place or other, for the seepage of water from surrounding land to enter, and remain for a time, at least, one, two or three feet below the level of the finished road. Consideration must be given, therefore, to the advisability of laying good, hard burned clay drain-tile at such points, and precautions of this kind will pay in the long run. It is a well established scientific fact that water takes on bulk when it freezes, and in the case of roadways, the subsoil is apt to be more tightly packed than that which has been disturbed to make a roadbed. Hence, when any large amount of water is allowed to gather in the soil below the driveway, there is always—or at least thru the winter months—the danger of freezing, with a consequent upheaval.

This danger is entirely obviated by even a simple drainage system, and the man who builds a driveway without looking into the possibilities of laying a system of drain-tile, is taking long chances with his pocket-book and his disposition.

With regard to the planning of the drive let it be sufficient to say, "Make it different." Anyone can do what he has seen the other fellow do, but it is not every man who can present new ideas, even in connection with the driveway. Devise some way of using flowers in connection with the drive, for they will greatly enhance its appearance. Get a



A Curved Driveway in Which the Brick Offers a Harmonious Line of Color That Finds Its Focus in a Brick Residence of More Than Ordinary Beauty good grade of brick. By this is meant a brick that is of the right color, and of sufficient hardness to withstand the wear it will receive. It is not necessary, however, to go to the expense of getting the same high grade that is called for by city specifications.

It will pay, however, to use real paving-brick; building brick, even when pressed, are not nearly as serviceable. It will pay, too, to use cement grout—this will give the roadway a monolithic construction which will wear as no other construction has ever been known to wear.

And, last of all—do not look upon the driveway as altogether utilitarian. It can be, and should be made as ornamental as the house to which it leads, or any of the gardening thru which it wends its winding way.

"BUYING WELL"

A Series of Short but True Stories Suggested by Experiences Recited by Owners and Operators of Plants

Where the Man With the "Buying Well" Eye Points His Periscope at a Date in Next Year's Calendar

One of the most serious charges that has ever been brought against the makers of clayworking machinery is that one firm or another is selling certain machines at cost (or less than cost) for the purpose of building a market for repair parts and replacements.

Whether this be true or not, is a question. *But there is no question as to the truth of the assertion that some machinery houses are willing to give a list of the parts of any of their machines, and to set a price on any or all of these parts, bought separately or together.* Added, the total cost of the parts is close to the cost of the complete machine.

Other concerns—notably one—have always refused to give a price-list of this kind, offering as a reason that the machine type may be out of date when the repair part is called for and so necessitate new patterns. Just now one is pointing to the sharp advance in the price of steel.

One manufacturer of brick and tile in the central part of New York insists that every order he places for clayworking machinery be accepted subject to an agreement whereby he will be able to buy all repair parts and replacements *during the life of the machine,* at a set pound price, plus a fair allowance for machining. This is "buying well."

Instances have been found within the past two or three years wherein the cost of repair parts on a brick machine ran three times as great (in proportion to the original cost of the machine) as the same parts did in the first installation. And the price of steel was going down at the time.

There is very strong circumstantial evidence that the machines which are sold below a fair average of the prices asked by other machinery houses, and for similar equipment, and which are not accompanied by some agreement as to the cost of future replacements, *are not built with a view to lasting service.*

Stop Here!

We have already said that the March 21 issue will contain full and complete accounts of the N. B. M. A. and the A. C. S. conventions.

Time was too short to include everything about those conventions in this issue.

The Clay Industry is Alive. Lots of things happened after we sent out the February 15 issue.

That is why this is a Live News Issue!

In Which Some Thoughts are Expressed Regarding the Most Perfect Machine on a Clay Plant

Hiring men, and retaining their loyal interest, is as difficult a problem as buying the right machinery and equipment. The human organism is, as has been often said, the most perfect piece of machinery made. "It's almost human" is the highest praise that can be given a machine.

The man who makes a quality product and sells it at a quality price, understands that his equipment must be of the very highest type; otherwise, in his eagerness to maintain his quality, he will pay out all of the difference between the price he gets for his product and that which is obtained for a poorer quality of material. This highly efficient machinery if often called "labor-saving." It might better be called "cost-saving," since its work is to produce a better article for less money than machinery which is less perfect.

In buying machinery of this character, the purchaser is confronted with the fact that equipment which has stood the test of time and which has "made good" on other plants, commands a higher price than something of—perhaps—equal power and equal perfection, but lacking the record. And he considers that he is serving his own interests, and those of his fellow stockholders, if he pays the higher price for the certainty of good performance.

In hiring men, however, he frequently overlooks the fact that the human machine is infinitely more perfect than the equipment to which he has applied the "Buying Well" principle. He advertises for a superintendent, for instance, and insists that "salary desired" shall be a part of the application. He sets an upset figure beyond which he will not go, and discards all of the replies that carry a desire for a salary beyond the amount he has in mind.

As a rule, the men who apply for positions are men of experience. They cannot be considered as men who are willing to "start low in order to get a connection with some good company." Frequently, they are men who have found their present employment unprofitable, not because of their own lack of ability, but because the men who owned the plants where they are now working are unprogressive, wasteful—perhaps unwilling to recognize merit in the place where merit should find recognition, which is in the pay-envelope.

A great industrial thinker has said that the man who is not working for a bigger salary is a man who holds back the progress of his work. The labor unions that set a man's daily wage also set the amount of work that he will do in a day of eight, nine or ten hours.

It may be that your present superintendent is working for a "bigger salary." If you, who are nearest to his work, do not see the value of his services to you, someone else may. That, perhaps, is why he answers advertisements.

And if, when the time comes that he tells you he is going to leave because he "can do better elsewhere," you find yourself wondering why someone else is willing to pay him more than you have been giving him—someone who is willing to do so with what must be a very imperfect knowledge of the man's worth, it will be an excellent idea for you to ask yourself a question or two.

To offer him more money after someone else has tried to buy him away from you, is to confess that you have been paying him too little in the past. And if you are paying him too little, do you think that a good way to "get capacity" out of a human machine?

The Story of the Continuous Kiln that Wouldn't Burn All the Brick it Could Hold

Altho the continuous kiln has demonstrated its claim to a "place in the sun" there are more clayworkers who are entirely unfamiliar with its construction than there are those who have even the slightest knowledge of how it should be built, or how they ought to go about having one constructed.

There is, as a consequence, a lamentable lack of knowledge, when it comes to drawing up a contract for the construction of one of these kilns—a serious matter, since it involves the expenditure of a comparatively large sum of money.

Some years ago, a large operator decided that the continuous type of kiln was the proper thing for him to install, and in the course of time he called upon a number of concerns which made a specialty of continuous kiln construction. The one which finally secured the contract was the one that guaranteed the greatest capacity for the smallest amount of money.

After the kiln was built, it was found that the number of brick (or brick equivalent in hollow-ware) was about eighty per cent of the figured capacity—the capacity upon which the installation contract hinged.

When the brickmaker came to look up his contract, he found that the contract read "holding capacity." True, the kiln would "hold" the number of brick which had been written into the contract, but if that many brick were put into each compartment, it would be impossible to burn them.

This kiln concern, by taking advantage of the ignorance of the clayworker, had succeeded in securing the contract at what was really a higher figure than its competitors.

This "tip" should be equally valuable to the men who are about to build continuous kilns and to the men who build them. Each should ask the other whether the "capacity" that is being figured is practical, and each should see that there is a clause in the contract which provides for the actual burning of the figured capacity, with a proper amount withheld to cover "contingencies"—such as might arise from either accidental or intentional "miscalculations."

BRICK ADVERTISING *DeLUXE*

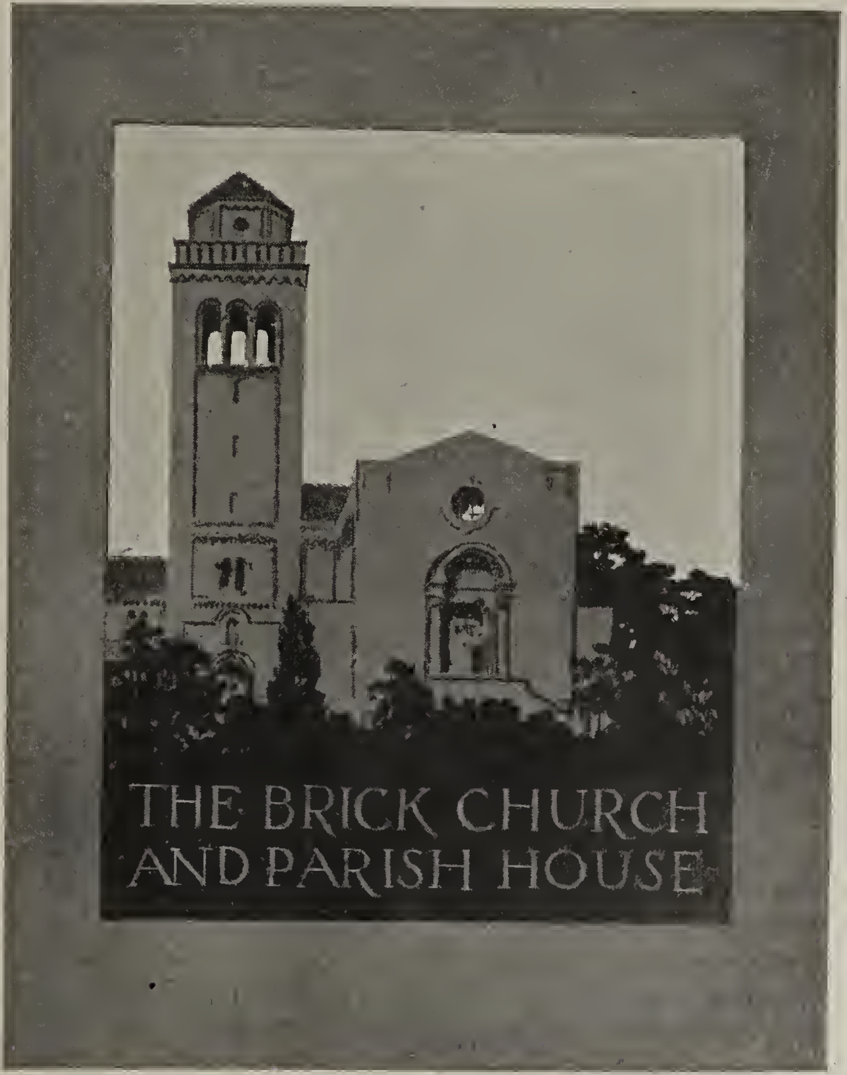
ADVERTISING LITERATURE, to live, must be educational. The more it bears the stamp of actual, as well as apparent merit, the less apt it is to find its way to the graveyard of the printed word—which is the waste basket—or the morgue, which is the dusty file.

So, while it seems out of harmony to mention either the waste-basket or the dust-covered "library" of the atelier in connection with the book which has recently been issued by the Hydraulic-Press Brick Company of St. Louis, Mo., the warning signal must be flown, in these days of misdirected advertising appeal.

Some months ago, the "Brickbuilder" of Boston, Mass., announced a competition for a small brick church and parish house, the jury of award being made up of prominent architects practicing in Boston, Omaha, New York and St. Louis. The result was a splendid collection of perspective and floor plans, reflecting the modern trend of architectural thought in ecclesiastical work.

The prize-winning drawings, together with those which gained honorable mention, have been brought together in a brochure measuring 11 by 13½ inches, the cover of which is illustrated herewith. It is far and away the most ambitious attempt that has ever been made in the brickmaking industry to place in the hands of architects thruout the country, something that will aid them in their work of giving proper lines to buildings devoted to religious purposes.

The Hydraulic-Press Brick Company is to be congratulated on its willingness to invest so large a sum of money, so much thought and intelligent planning, to a work in which the educational idea is uppermost and the advertising merely an incident.



The Hydraulic-Press Brick Company's Latest Addition to Architectural Literature.

BUILDING *a* POTTERS' DOWN DRAFT KILN *with a* CENTER STACK

With Comparative Figures on Life and Economy of Operation as Contrasted to Kilns of Up-Draft Type

By E. T. Montgomery, E. M. (In Cer.)
Professor of Ceramic Engineering, Alfred, N. Y.

THIS PAPER was originally presented before the American Ceramic Society and forms a part of its copyrighted "Transactions." It is reprinted by permission and in response to numerous requests for information on the construction of kilns of this type. The drawings and other necessary data were furnished by Professor Montgomery and revisional notes made by him especially for this publication.

IN THIS PAPER no attempt will be made to compare types of construction. It will be merely a description of the construction, and a discussion of the merits, of a very satisfactory and successful center-stack down-draft kiln which the writer has used in practice and which he can commend to your use for stoneware, enameled-brick, electrical porcelain, floor and wall tile, whiteware or, in fact, any kind of clay product that can be economically burned in a round kiln and where the position of the stack in the center of the kiln will not seriously interfere with a car system of unloading if that system be used.

I trust that some of the advantages of construction, the efficiency, and the economy of fuel consumption of this kiln, will appeal to you and increase in the industry the use of a kiln that, as far as my experience and observation goes, has "made good" wherever adopted, and which, I believe, with the application of the continuous principle which we will discuss later, will be (at least until we are ready to adopt the continuous or tunnel kiln of Europe) the kiln of the future in its particular field; and that field, I am fully convinced, will overlap the present day up-draft potters' kiln now used in practically all of our whiteware plants.

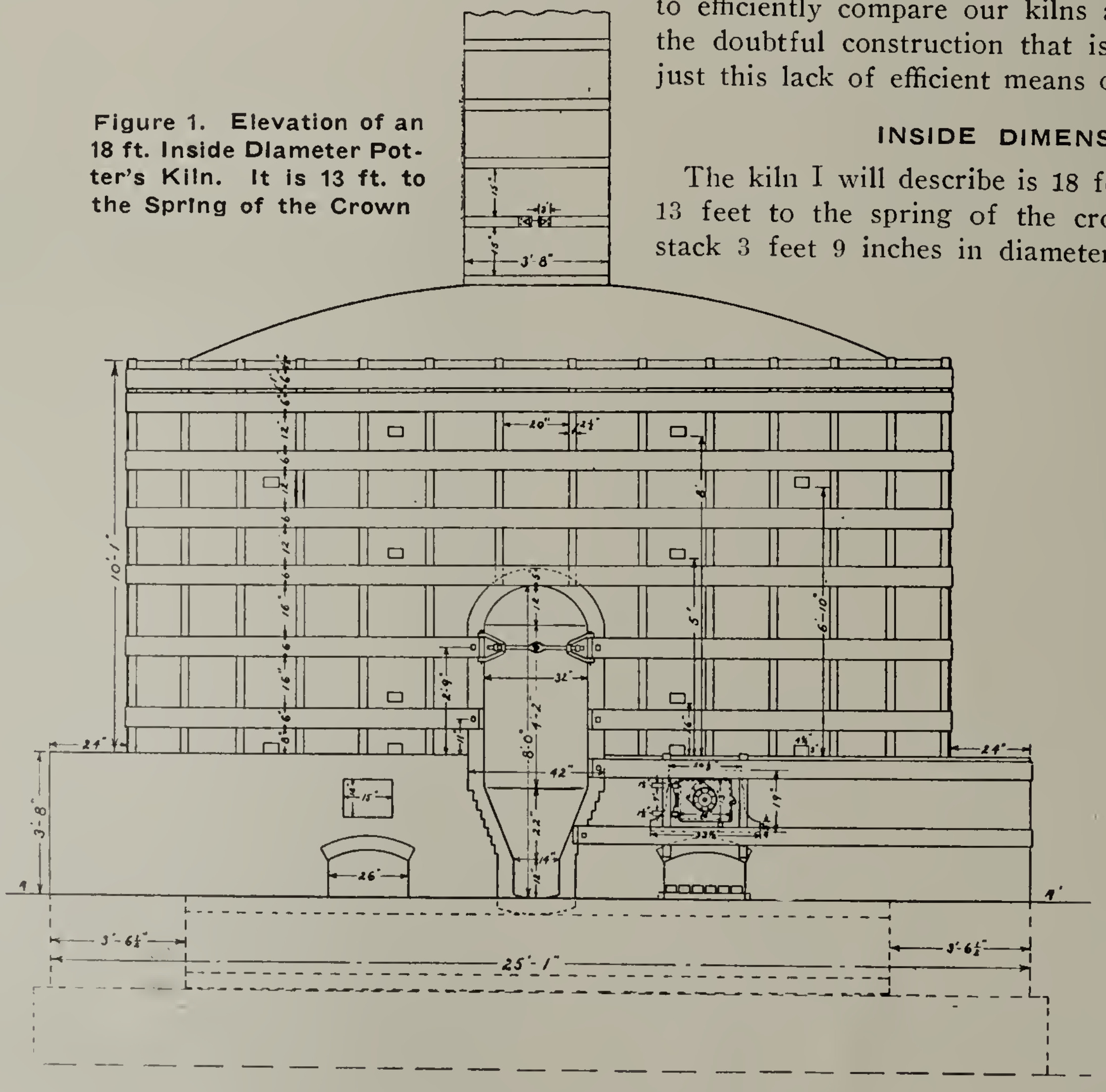


Figure 1. Elevation of an 18 ft. Inside Diameter Potter's Kiln. It is 13 ft. to the Spring of the Crown

Another reason for this paper in the form in which it is given is that it is high time we were getting into our ceramic literature some exact designs of kilns with measurements and dimensions that can be used in the construction of kilns elsewhere, or in discussion of improvements. It is only in this way that we will ever be able to efficiently compare our kilns and eradicate some of the doubtful construction that is sometimes used thru just this lack of efficient means of comparing notes.

INSIDE DIMENSIONS

The kiln I will describe is 18 feet inside diameter, by 13 feet to the spring of the crown and has a center stack 3 feet 9 inches in diameter (outside). The rise of crown is 2 feet 2 inches.

FOUNDATION

The foundation is of concrete and about 12 inches thick on hard, well tiled soil. It is carried out under each ashpit as well as under the kiln proper. This foundation insures a solid, level and dry kiln bottom.

FLUE SYSTEM

The flue system is best shown in Figure 3, which almost explains itself. There are 17 horizontal parallel flues 7½ inches wide by 19 inches deep to the concrete foundation. The system of arches thru the flue walls are arranged in a figure eight, together with 3 other rows of arches at right angles to the flues. This design has given excellent results in connection with a properly proportioned checker floor over the flue system. In this checker

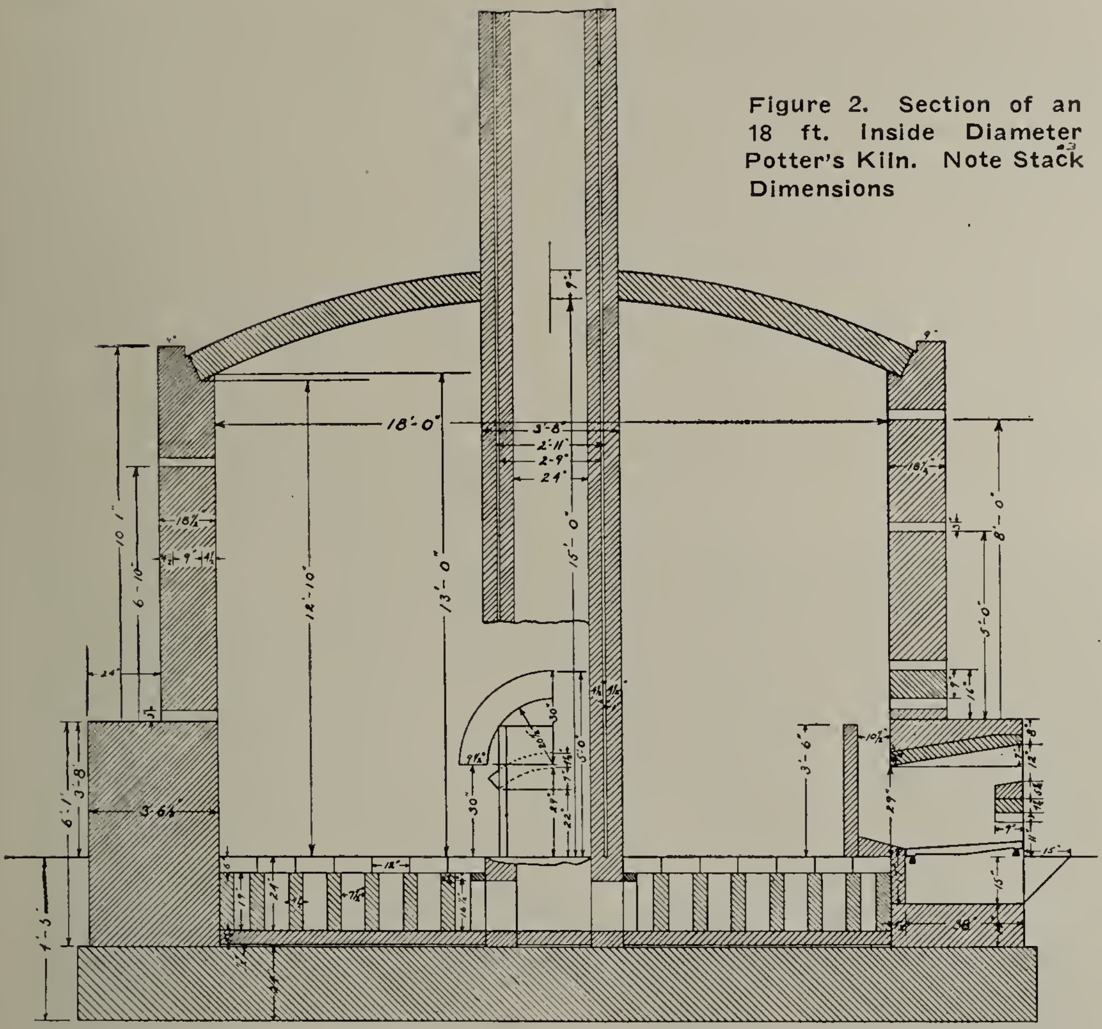


Figure 2. Section of an 18 ft. Inside Diameter Potter's Kiln. Note Stack Dimensions

floor the openings should increase in number or size from the stack out to the wall. You will note that the line of the direction of the flues is at an angle to the line from the center of the door to the center of the stack. This was done so that the covered flue to the stack would not conflict with the fireboxes. This flue could be put under the flue system, in which case the line of door, stack, and firebox No. 5 could be made parallel with the flue walls. The flue walls are 4½ inches wide and are 12 inches center to center so that they take a checker floor brick of 5 inches by 12 inches face. There are 8 arched openings into the bottom of the stack and they should be made deep enough so that their total area is equal to the area of the stack. The covered flue has a damper outside of the kiln, and is used to cool the center of the kiln during the later part of the burn and drive the heat to the outside if necessary. It can also be used as a damper as the draft thru the kiln is lessened when this flue is opened and allowed to draw cold air direct from the kiln room.

FIREBOXES

The fireboxes are 9 in number and equally spaced about the hob except at the door, where a little extra space is required to get the door in. This extra distance from center to center of the fireboxes on each side of the door should, for obvious reasons, be made as small as possible. With the one exception, the distance from center to center of fireboxes on the outside wall is 8 feet 3 inches. Figure 4 shows the section thru the hob, firebox, ash-pit and bag. The bag-walls extend down to the concrete foundation and the grate bars are 4 feet 5 inches long, reaching to the back of the bag and resting on a cross bar set to receive them. The long bars have the advantage of keeping the mouths free from clinker and they also make the mouths easier to clean after the bars are dropped, there being no place for the ash and clinker to lodge, as in the case of the short bar used with a bag extending only to the kiln floor. Cutting out the clinker on the floor at the bottom of a short bag is very difficult to accomplish and also very hard on the kiln. Of course, with a long bag reaching to the foundation, we lose the value of a flue under the bag, but with a good large opening between each bag in the checker floor, I have experienced no difficulty with cold spots at these points.

THICKNESS OF WALLS

The walls are 3 feet 6½ inches thick thru the hob and are 18½ inches thick above the hob. The kiln is lined with one course of fire-brick tied by headers to the red brick wall. All fire-brick in the walls and stack are laid in fire-clay mortar, soaked in water before placing and laid with very close joints. The outside walls are laid up in cement mortar and with close joints also.

CROWN

The crown of a kiln should always be the arc of a circle and in an 18-foot kiln the rise should be about 2 feet 6 inches. A crown should always be laid with a radial sweep or gauge, and the best one to use is one so constructed that the brick are laid against its end, the gauge being moved around the crown as each course is laid and keyed in. Figure No. 5 shows this method very nicely. Here the brick mason is working from below as the crown is a lining under a crown already in position. Figure No. 6 shows the correct way to use such a gauge, two men working from the top. One man and his helper can lay, by this method, 3,000 brick in a crown in 8 hours and at the same time lay a perfect and solid crown. The construction of such a sweep or gauge has been described before so I will only repeat here for the

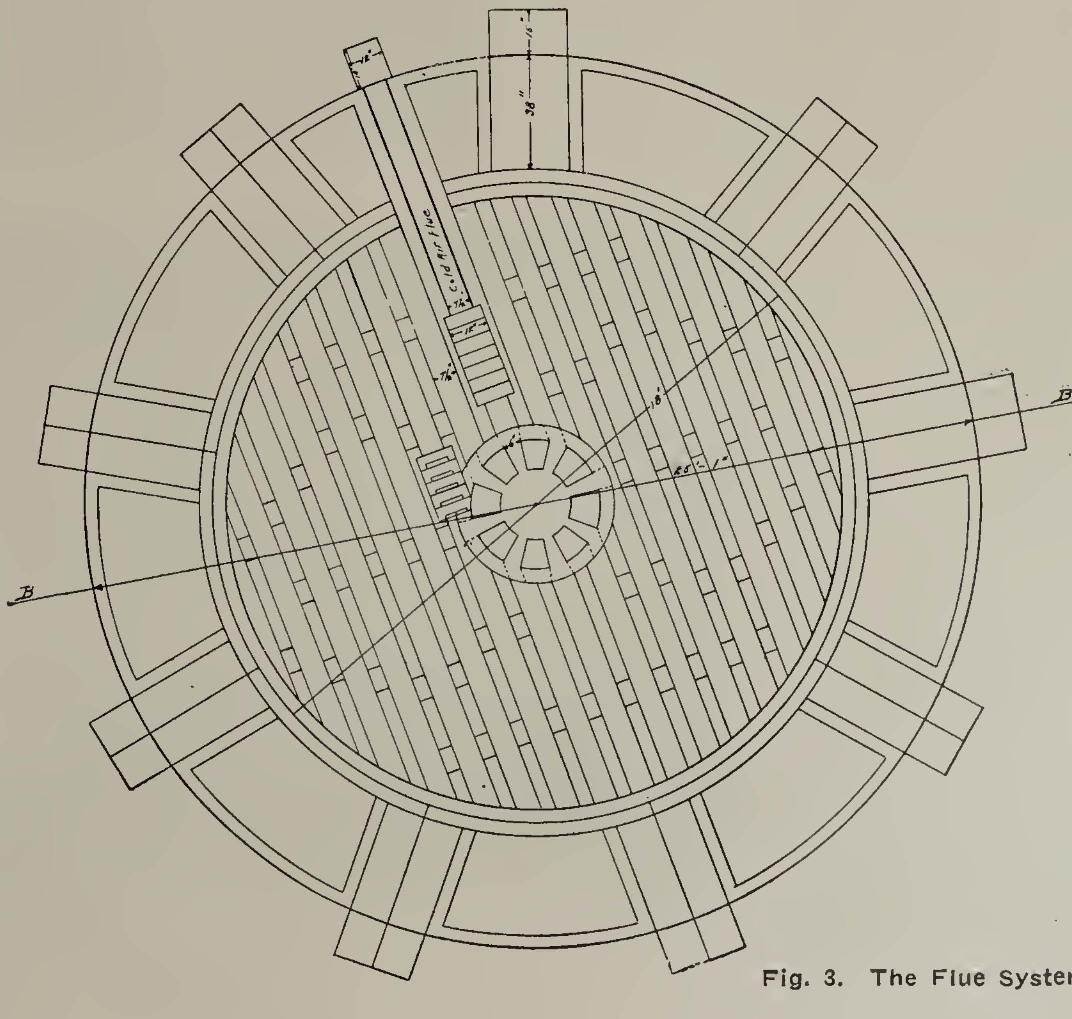


Fig. 3. The Flue System

sake of completeness, the method of figuring the length of the gauge. Let A = the desired rise of crown, B = the inside diameter of the kiln, and X = the length of the sweep. To find X in the triangle of which X is the hypothenuse we have: (See Figure on next page.)

$$X^2 = (X - a)^2 + \left(\frac{b}{2}\right)^2$$

$$X^2 = X^2 - 2ax + a^2 + \frac{b^2}{4}$$

$$8ax = 4a^2 + b^2$$

$$X = \frac{4a^2}{8a} + \frac{b^2}{8a}$$

$$X = \frac{a}{2} + \frac{b^2}{8a}$$

or in words—the length of the sweep is equal to half of the desired rise of the crown plus the quantity equal to the diameter of the kiln squared, divided by eight times the desired rise.

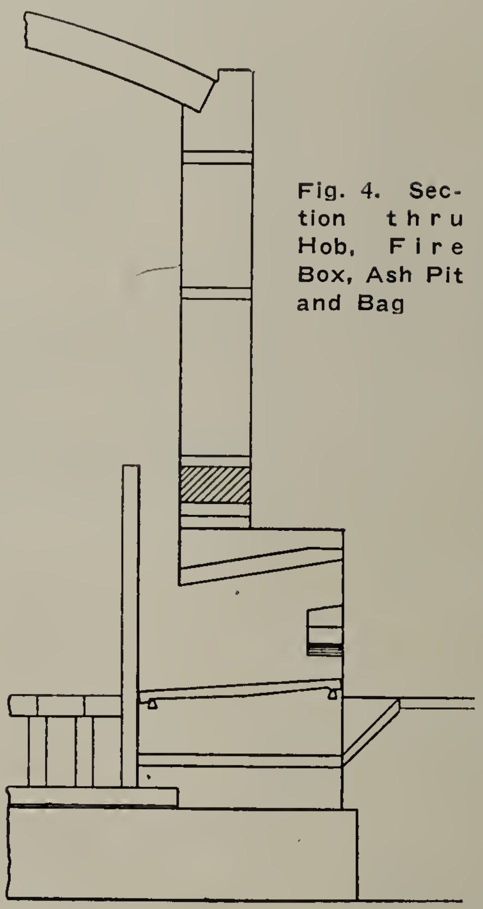


Fig. 4. Section thru Hob, Fire Box, Ash Pit and Bag

STACK

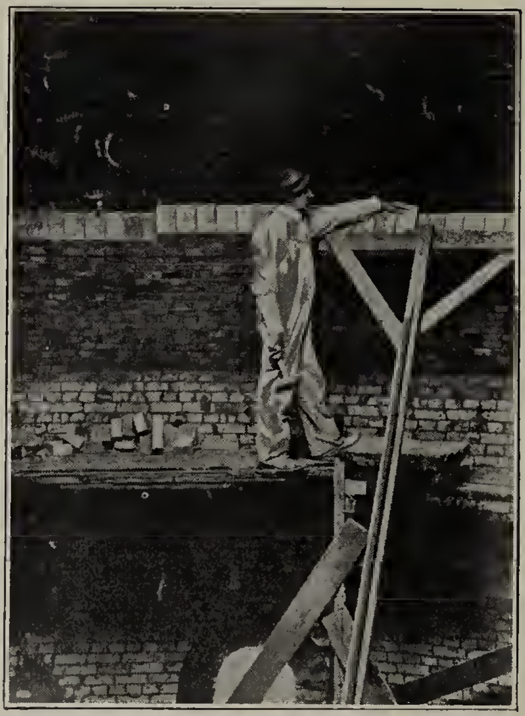
The stack is double-walled with an air-space between. The inside stack is 24 inches in diameter inside and the outer one is 36 inches in diameter inside. The stack extends about 15 feet above the crown and terminates in a stack damper.

COOLING VENTS

For the purpose of more rapid cooling the kiln is provided with two crown plugs, as shown in Figure 8, which can be removed, thus connecting the vents by pipes to an exhaust fan which draws out the hot air from the top of the cooling kiln.

BANDING

As Figure 1 shows, the kiln is well banded both horizontally and vertically. Vertical banding is most essential to keep the horizontal bands from cutting into the kiln, and to prevent lateral shifting due to expansion and contraction. The top horizontal band should, of course, lap the top course of brick.



CENTER vs. OUTSIDE STACK

This about covers the details of construction, and before making a summary I wish to say that I am not advocating primarily the center stack versus the outside stack, but I chiefly desire to call your attention to this type of kiln, whether the stack be inside or outside. For many purposes I prefer the center stack and in other cases we could find just as good reasons for an outside stack serving two kilns.

Figures 5 and 6. Illustrating the Use of the Radial Gauge. The Lower Illustration Shows the Construction of a Terra Cotta Muffle Kiln with Double Crown

This type of kiln, however, with a center stack, is a compact, self-contained unit; its floor is on a level with the kiln shed floor which makes it an easy kiln to place; a careful regulation of the floor openings will give perfect distribution of heat from the outside ring to the center; and given careful firing and sufficient time, it will give even heat from top to bottom. The stack heats up rapidly, giving a good draft almost at once after starting the fires. It also forms a support for the ware or the bungs, and is of considerable advantage in many cases, especially at high temperatures such as those used in the porcelain industry. It is adapted to the waste heat drying system by the use of the crown plugs shown and an exhaust fan to drive the hot air into the drier.

FUEL CONSUMPTION

It is economical in the use of fuel and could be made more so by the application of a continuous system of firing. The kiln described burned an average of one hundred and twenty-five bungs of porcelain to cone 11 down, 12 started, in thirty-six to forty hours, using an average of nine tons of good bituminous coal.

CONTINUOUS SYSTEM

The center stack also lends itself to the application of the continuous principle much better than the same kiln with an outside stack could do. An idea of such a system is given in Figure No. 9: After kiln No. 1 is started thru its own stack, the damper is closed and it is forced to draw thru No. 2 and its stack, the hot gases from No. 1 being introduced at the bags in No. 2, possibly thru a hollow bag-wall or, better, thru the kiln walls by means of flues and into the bags above the fire. The gases would be too hot.

(To be Continued)

MOTORING *into a* MARKET

How Motor Trucks Helped a Brickmaker Increase His Output from Four to Forty Millions

AN INCREASE in production of nearly *eight hundred per cent* in two years—due largely, if not solely, to the use of motor trucks for delivery—is the record made by the American Building Brick Company, of Cleveland, Ohio.

In 1913 this company manufactured 30,000 soft-mud common-brick a day, the plant being operated but six days a week for six months of the year. The total production for that year was approximately 4,500,000 brick. These brick were delivered by team, the distance, however, being limited to a radius of four miles from the plant, which is in the west part of Cleveland.

Incidentally, it might be said that with the delivery equipment that the company then possessed, it was impossible to take any orders for brick to be used in the east part of the city—a territory which, in the past few years, has enjoyed a remarkable growth, involving considerable business in building material lines. This was due to the fact that the long haul by team consumed all of the profit that there was in the load.

How to get into this attractive market—the east side of Cleveland—and still make a profit on his brick, was the problem that confronted Lawrence B. Koblitz, general manager of the company, back in 1913. To solve it he decided to try out a motor truck, and accordingly, in the autumn of the same year, a six-ton truck was purchased and placed in operation.

It was soon found that it was possible to deliver brick into the much-desired territory at a profit, as the small amount of extra hauling cost was charged to the customer, who willingly paid it, and thus a new market was opened.

Immediately two more trucks were purchased and, since that time, three more have been added, the latest of these having recently been acquired and placed in operation.

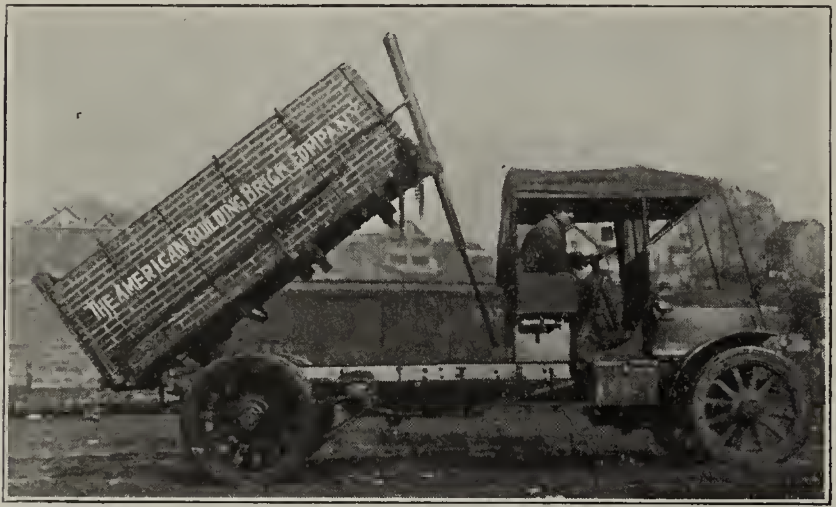
During 1915 the output from this plant was 100,000 brick per day for three hundred and sixty-five days. No stop was made for Sundays or holidays. Last year's production totaled 36,500,000 brick—a gain of eight hundred per cent in two years. Three soft-mud machines are required to maintain this capacity, and the company finds that it need not buy any more trucks until a few more brick machines are installed.

While for the sake of conservatism it might be said that this increase can hardly be attributed entirely to the motor truck, still it must be remembered that during the early part of 1915 building in Cleveland was not at all normal. The summer, owing to unusually unfavorable weather, was exceptionally dull. Jobs in Cleveland during July, August and September of last year were as scarce as the much-searched-for hen's teeth, yet this plant was operated to capacity, and sold all of its output thru an extended market.

There is some interesting data available covering the cost of operating these trucks, which should be of value to every plant owner who is contemplating a change in his delivery methods. During 1915 the cost of operating the five six-ton trucks amounted to $18,000. This figure covered all of the usual charges, including gasoline, lubricating oils, drivers' wages and repairs, but did not include fire and accident insurance, which amounted to $500; interest on the initial investment, six per cent on $30,000, was $1,800, and a charge against the trucks for depreciation for which twenty per cent was allowed, figuring a total of $6,000 for this item.

Adding all of these charges, it was found that it cost a total of $26,300 to operate these trucks for the entire year. Figuring at the rate of three hundred working days in the year, at daily cost of $17.53 for each truck is arrived at. The average day's work for a truck consists of hauling at least 12,000 brick on long trips, some of which are as far as twenty miles from the plant, and from 15,000 to 20,000 brick each day on short trips. This would give a cost of $1.46 per thousand on long hauls and $1.17 on short hauls. Compare these delivery costs with those in your own town. For those who do not have these figures at hand, it might be said that in the city of Moline, Ill., a contractor gives a charge of $1.75 per thousand for common-brick hauled by team from the cars to a job that was but a short distance away.

However, it must be remembered that in the case of the American Building Brick Company, the larger part of the cartage on the long hauls is paid by the customer, while that on the short hauls is not. Thus it will be seen that it costs more per mile to deliver brick with the trucks on short hauls than on longer trips. This has been the experience of most clay products manufacturers who are using trucks. They find that this method of delivery pays handsomely on long hauls, but does not show a profit on short trips. The American Building Brick Company is still using teams for placing the brick used on nearby jobs—a business that takes about twenty-five per cent of its production.



One of the Trucks—the Company Has Six of Them—With Box Elevated as When Dumping Brick. Much Time and Labor is Saved in This Way

One reason for the favorable showing made by the 1915 operating costs is that the wheels of the trucks were kept turning constantly, except for a short period when the machines were being overhauled. This element enters largely into the successful operation of any motor truck, for whatever purpose it is used, and it is particularly true in the case of a brick plant.

The trucks shown in the accompanying illustrations are large and strong, the rear wheels being equipped with hard rubber tires, so as not to injure the city pavements. The box is painted in imitation of a bright red brick wall, with the name of the company appearing in white lettering. The back end of the box is hinged at the top and secured by a catch at the bottom, which is released from the driver's seat when the box is raised to dump the brick.

When these trucks were first put into operation by this company the objection was raised by the contractors that the dump-method of unloading the brick increased the percentage of breakage over the old way of throwing the brick from a wagon. This, however, was soon disproved, as it was found that of the 2,667 brick, which is the capacity of the box, only the first few brick were broken in falling to the ground. While these particular brick were perhaps more badly broken than would have been the case had they been thrown from a wagon, it was found that the remainder of the load suffered little or no damage, because the first brick on the ground acted as a cushion to the rest of the load.

The men who drive these trucks are mechanics. They have had practical experience in the manufacture of automobiles in a local factory, and know how to take care of the machine which they drive. The company has found that it pays to employ men of this type, for, while their wages are higher than the ordinary chauffeur, they save more than this increased cost, by cutting down the amount of repairs, and by saving time thru knowing how to adjust the engine and make small repairs while on a trip.

But in addition to these measures for increased service, all of the trucks are overhauled once each year, during the latter part of the winter. They are practically "skinned" to the chassis and then rebuilt, every nut and bolt receiving the most minute inspection and a careful tightening. The drivers, as may be seen in one of the accompanying illustrations, do all of this work.

The motors on these trucks receive even more careful attention. They are overhauled every one thousand miles that the truck travels, when such repairs and replacement of parts are made to keep the motor in perfect condition.

Owing to the value of the investment which is contained in these trucks, each one costing about $6,000, none but married men are employed as drivers. It is the belief of the company that they are more careful than younger and single men, and, it is, therefore safer to entrust them with valuable equipment.

The corps of drivers has become so large that a foreman has been appointed to superintend their work. He drives a truck in the busy season and works about the shop with the other men, the difference being that he is responsible for what is going on in his department. When business slacks up, and it is not found necessary to operate all of the trucks, the foreman is the first man to stay in the garage.

While considerable importance is attached to the comparatively low cost per thousand for delivering brick with these trucks, the more significant fact, in the case of the American Building Brick Company, is that the trucks opened a new market for its products. Just as surely as freight rates limit the shipping radius, and, therefore, the market of any manufacturer, so antiquated delivery methods restrict the home market. The American Building Brick Company has opened up a new line of thought in connection with the use of motor trucks—that of a wider sales territory, and at prices that insure a larger margin of profit thru reduced delivery costs.

Interior View of the Garage Where Each Truck is Given an Annual Overhauling. The Machines are "Skinned" to the Chassis to be Practically Rebuilt by the Mechanic-Drivers. The Amount of Time and Avoidable Repairs Thus Saved in a Year is Considerable

The SUPERINTENDENT

Helpful Hints for Practical Men
Whose Problem is Maximum
Production With Minimum Cost

CUTTING ARCH BRICK *in the* GREEN

The device that is illustrated herewith will be found very useful in cutting "green" brick on the yard, as well as for marking brick that have been burned to standard size and which are either to be cut on the job, or ground to radius on the rubbing-bed.

Where used for cutting "green" brick, the wire should be doubled and strung parallel. Across the top bar (A) holes should be placed sufficiently close together to allow for practically any top width and at the same time, give an odd number of brick in the reveal. Where the details call for a stone or terra-cotta key, there will be an even number of bricks in the reveal. Either contingency may be provided for by a reasonable closeness in the spacing of the holes.

Pin-holes are also shown in the piece of 2x4 that is marked "C." These need not be spaced less than one inch apart as it is very unusual for an architect to express his radius figures in fractions of an inch.

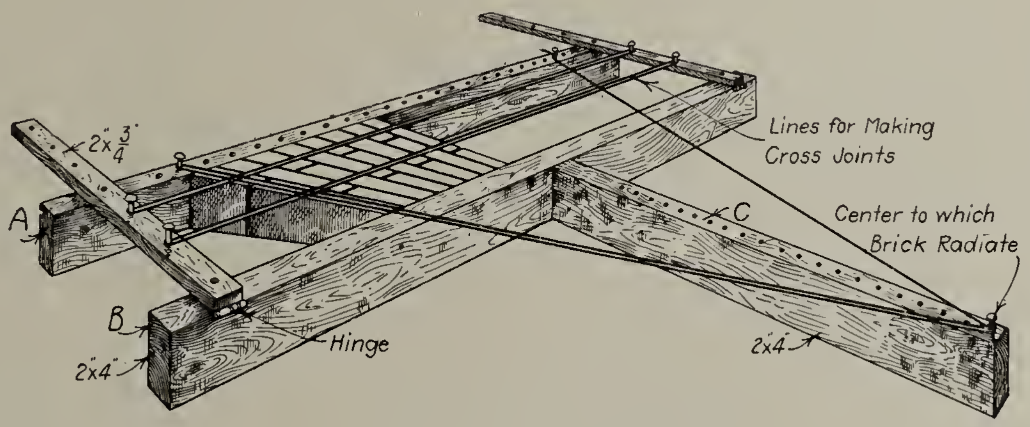
Every flat arch should have a slight "spring"—otherwise the finished work has the appearance of dropping down. This may be provided for by nailing a strip of wood or steel to the inside of the piece of 2x4 which is marked "B". This strip of wood or steel should start flush with the ends of "B" and be so curved that it will rise about three-quarters of an inch in the center; that is, "A" and "B" will be three-quarters of an inch nearer to each other in the center of the arch than they are at the extreme ends of the device.

When making arches in this manner it is well to take long pieces of the clay bar and tamp them into place. Where there is any chance or liklihood of a split being caused by the failure of the clay to "knit" it is advisable to cut but a few brick at a time.

The actual work of cutting may be done with a trowel or heavy knife. The wires that run from end to end—that is, from one of the hinged pieces to the other—are not placed until after the radial cuts have been made.

When this device is used for the purpose of marking bricks that have already been burned, then it is only necessary to use a heavy cord in place of the wires and the marks are made on the brick either with chalk or with a wax crayon.

The device is not patented. It is the invention of John A. Keenan and Albert Moore, two students who are taking the course in bricklaying at the Williamson Trade School in Delaware County, Pa.



To Aid in Cutting Arch Brick

Unloading Fire Brick Kilns

By H. L. Longenecker

A PROBLEM that has long perplexed manufacturers of fire-brick is the proper handling and grading of their ware from kilns to cars. In many plants, even where every brick in the kiln is perfect, there is a slight variation in hardness of burn and in color, as the brick come from the top or from the bottom of the kilns. In many cases, too, different varieties of standard brick must be carefully handled and packed for shipment.

If the problem is to be considered only from the quantity standpoint, the method of paying each laborer for the number of brick he handles is an easy solution. The trouble is, that where this method is employed the man will almost invariably load every brick that comes to him. If the foreman be severe, and penalties for bats and ill-assorted loads are exacted, the system is at its best, but—the men will feel that they are underpaid, as they are not, as a rule, paid to grade the brick. Let the foreman relax his vigilance, and a bad car of brick, containing an inexcusable number of bats or other rejectable brick, is a sure result. In this way a bad car of brick gets away, and the sales department is confronted, like as not, with a condition that is apt to cost the plant an amount out of all proportion to the profits on the order.

True, the blame can, at times, be traced back to the men who loaded that car, and a small amount can be charged against them and deducted from some succeeding pay-envelope. But the amount so exacted as a penalty must be small, or the men will be dissatisfied, and in no case can it be made large enough to cover the allowance that is made the customer—an allowance that, in many cases, wholly fails to restore that customer's good opinion of the company responsible for the shipment. A repetition is almost sure to make an otherwise good customer "sore" and future allowances only pave the way for an inspection of future shipments that will be altogether too severe to bring a profit out of future orders.

Meanwhile, it is manifestly impossible for one superintendent or foreman to see every brick that is loaded by a gang of four or six men, unless the loading is done in one car, or at most in two cars that are placed close together.

An improvement on the method outlined (and which is used in many fire-brick plants) is to supplement the efforts of the foreman with inspectors in proportion to the number of wheelers, or one for each kind of brick that is being loaded. If the inspector is a trained observer of brick and the cars in which he must inspect the unloading are not too widely separated, the improvement in quality of brick shipped, over the method first outlined, is very noticeable. The wheelers, by being compelled to replace without pay each bad brick brought into the car, do their best in grading as soon as they find that this is the course of least resistance.

The position of inspector is one well suited to experienced men who are incapacitated by age for heavier work, and they will give their best efforts to retain these positions. The wheelers feel that the responsibility is lifted from minds untrained to mental exertion, even tho their efforts in grading must be redoubled, and no diminution in speed is noticeable.

A third method that is a complete sacrifice of speed to quality, is the system under which the wheelers work for a fixed daily wage. Under a good foreman, there is no excuse for ill-assorted brick by this method, but little comment need be made as to its expensive wastefulness.

There is a fourth method, in use by one of the largest companies in the United States, which produces equal or better results than any one of the other three, and produces them economically. This system divides the loaders into crews of four men each, and pays each crew a wage per thousand for the number of brick handled. Of each crew of four men, two men are wheelers; the head of the gang is called the "pick-up" and stays in the kiln or at the "hack" supervising the grading and selections of brick while helping the wheeler to load. He also tallies the number of loads. The station of the fourth man is in the car, where he inspects and helps unload each wheelbarrow. He is called the 'hacker" and shares the responsibility of selection and quality with the "pick-up." The men individually can make almost as much money by this method as by any of the others, for when all are wheelers considerable time is lost loading and unloading. There are two inspectors to each gang, one of whom is responsible for the careful loading and packing of the car. When this method is used (with careful supervision) ill-assorted cars and cars containing bats, due either to careless loading or handling, are rarities.

Wheelbarrows only are mentioned in this article, but it can readily be seen how easily the last named method would work in with the new electric storage battery trucks with detachable beds. Here the number of loaders or "pick-ups" and unloaders or hackers are doubled. The truckman takes the place of several wheelers, and the system is preserved intact with greater economy and reliability, but with the same assurance of quality.

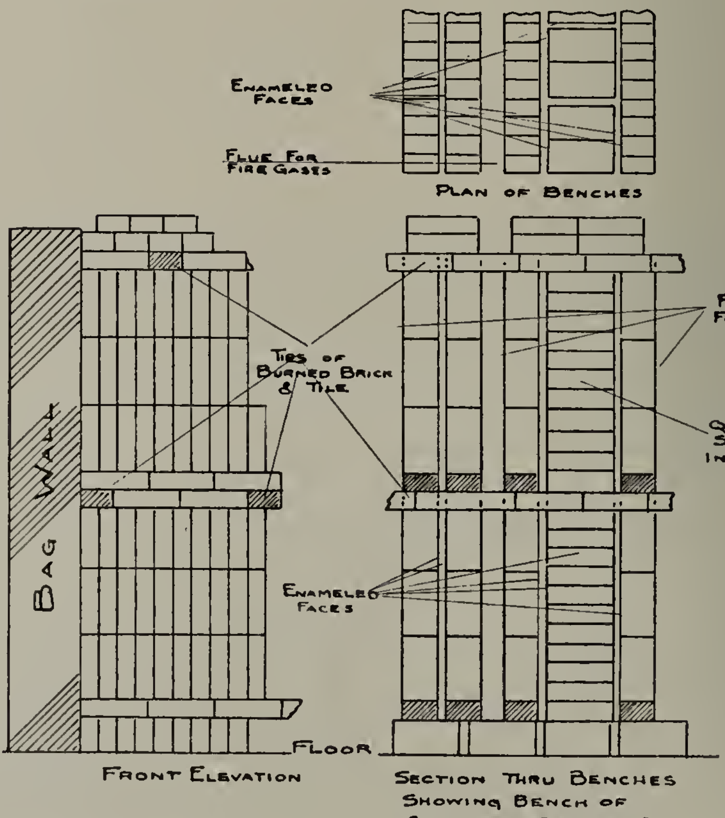
To maintain speed on long runs, and where wheelbarrows are used, it is only necessary to increase the number of wheelers.

Some superintendents contend that a properly organized loading gang will so select and sieve out bad brick, that no matter if the plant does have little streaks of bad brick, no dissatisfied customers will result, and that unless this bad streak becomes so pronounced that orders must be filled and no good brick are available, the loading organization will meet that requirement.

This is doubly true in a plant where badly made brick and bats are discarded at every step in the course of manufacture, drying and setting, and where the principle of wasting coal on an imperfect brick has been found to be a bad business policy. No matter how good the loading gang, nor how careful the sorting, the plant with any other policy will find it difficult to compete in a quality market.

The Private Hospital on the Clay Plant

You may not see it now, but if you grow, you will come to it. No matter how "fully covered by (accident) insurance" you may be, nor how much some workmen's compensation act may make it seemingly advisable to let the man who is hurt while in your employ *stay hurt* until the commissioners get around to his case, your own good sense tells you that you will save life and ease suffering, every time something happens at your plant that endangers one or produces the other. The private hospital is the natural sequence of "Safety First." A new publication, called "Hospital Management" has recently come to our notice. In it is a department devoted to industrial hospitals—the thing you will surely come to, if you grow. The magazine is published in Louisville, Ky., and it will be worth your while to send for a sample copy, if only to know something of the plant hospital you will build. when time brings you the breadth of vision that you should have, to be a successful director of other men's labor.


Enameled Faces
Flue For Fire Gases
Plan of Benches
Bag Wall
Ties of Burned Brick & Tile
Flues For Fire Gases
Quoins & Specials in Muffle.
Enameled Faces
Floor
Front Elevation
Section Thru Benches Showing Bench of Standard Squares & Muffle For Specials

Method of Setting Single Fired Enameled Brick

(See Article on Page 447)

Some "Don'ts" in Regard to Blasting

We believe that all employers of labor try to exercise reasonable care to prevent accidents to their men, says a writer in the "DuPont Magazine." Ordinary instincts of humanity, if nothing more, would dictate such a policy. In the state of Pennsylvania, however, there are some reasons that may be called additional to those of mere humanitarianism. The new Compensation Law makes the adoption of safety features more imperative in that state, than ever before.

We feel that a few suggestions to employers in lines of work that call for the use of explosives will be particularly *apropos* at this time:

1. Use low freezing extra dynamites wherever possible in preference to the high freezing straight dynamites. They are safer because they are less sensitive to accidental shocks, and seldom require thawing. In addition, they are considerably cheaper.

2. Adopt electrical blasting methods wherever possible in preference to fuse and blasting cap method. The principal object of this is to prevent hang-fires and misfires which are always dangerous to workmen.

3. Every blasting operation should have a galvanometer for testing blasting circuits and a rheostat as a part of the equipment. These useful little pieces of apparatus eliminate guessing, which always entails risk of life.

4. When thawing is necessary, use standard thawing kettles or thawing house equipment instead of permitting employes to soak frozen dynamite in warm water, or to heat it in ovens, or to thaw it by standing it around an open fire. All of these practices are dangerous.

5. Magazines should be kept clean and dry. Sand, nails, or other foreign substances on floors may cause explosions and result in loss of life.

6. Magazines should be properly located to comply with the American Table of Distances.

7. Dynamite and blasting supplies should be kept separate until they are ready to be loaded into bore holes.

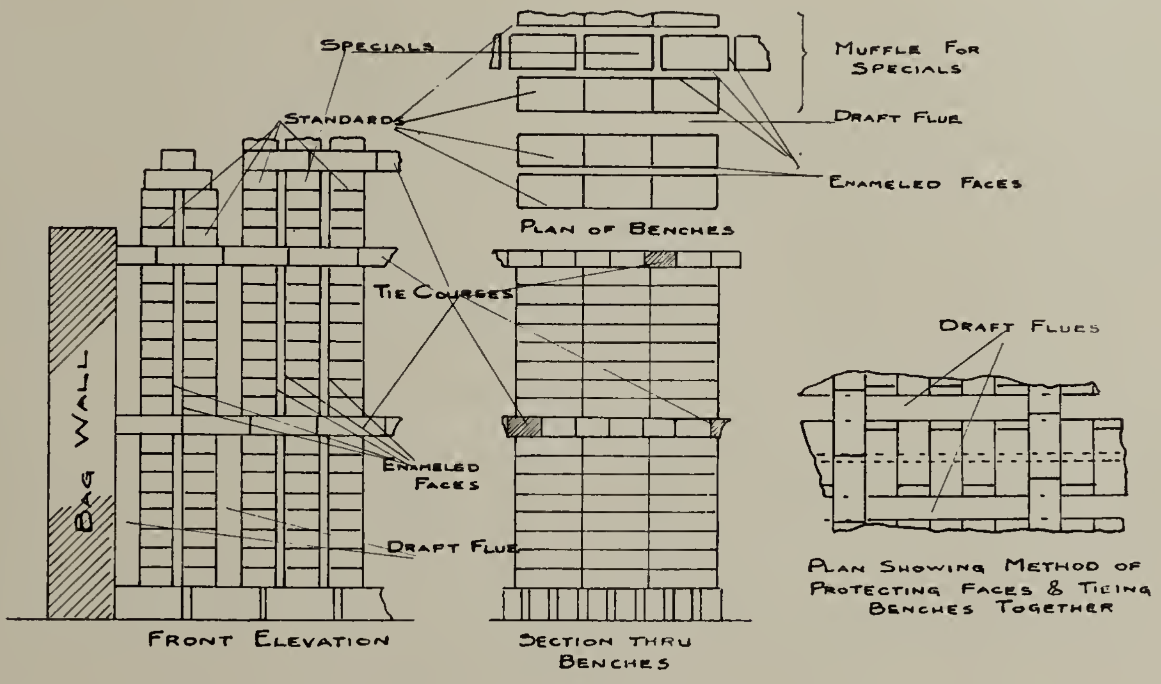
Compliance with the above simple suggestions may save a good many lives and render employers immune from damages under the new Pennsylvania Compensation Law, *and what is good for Pennsylvania is good for any other state, even if it doesn't happen to have a Compensation Law.*

Setting Enamel Brick

While a great deal has been written regarding the relative merits of one-fire and two-fire enamel brick, as well as dry-press and stiff or soft-mud, little is in print regarding the setting. The diagrams herewith will, therefore, have interest for those who have been, are, or perhaps will, be connected with an enamel brick plant.

The drawing which appears on the opposite page, shows the method employed by most plants manufacturing single-fire brick. Single-fire ware, when set on the flat, generally gives too high a percentage of cracked ware. The quoins and shapes, therefore, are about all that are set on the flat, while the stretcher brick are set on end, the benches running from one side of the kiln to the other.

Two fired ware may be handled somewhat different, as there is less danger of cracking. The method used and illustrated on this page is very similar to that employed in setting flashed face-brick, only the enameled faces are always turned in, the gases passing on the unglazed side of the brick. As in the case of single-fired brick, the quoins and specials are set between benches of stretcher brick, these latter forming a muffle. The binding courses are always burned brick, unglazed, as these eliminate rolling.



Method of Setting Two Fired Enameled Brick

Since "Familiarity Breeds Contempt" it is well to give some thought to the effect your "Safety First" signs are having. Would it be well to change them to "Be Careful"?

RELATIVE CALORIFIC VALUE *of* WOODS

Wood	Lbs. Coal Equivalent to One Cord of Wood	Wood	Lbs. Coal Equivalent to One Cord of Wood
Hickory, Shell Bark	1,910	Beech, White	1,380
Oak, White	1,670	Pine, Yellow	1,060
Ash, White	1,440	Pine, Pitch	812
Dogwood	1,550	Pine, White	800
Oak, Black	1,390	Chestnut	1,000
Oak, Red	1,390	Poplar	1,080

QUESTIONS *and* ANSWERS

The Best Authorities in Every Clayworking
Branch Are Called into Consultation—Their
is Free to You, Thru These Columns

Grates in Up-Draft Kilns

752. *Montana—What size grates should be used for a common up-draft kiln? How big should the combustion chamber be? How high should the grate be?*

At the present time we are using a 16 in. by 36 in. grate and we have found that after firing for six days, we had to stop using coal and use wood instead, otherwise we would never have been able to raise the heat in the kiln. The coal we use does not clinker but burns into ash and after we had burned the kiln the ashes from the coal were scattered all thru the kiln, in some places to a quarter-inch thickness. We have had very good success in burning with wood but as coal is very much cheaper, we are trying to use the latter. We have, however, failed on the kilns that we have tried to burn with coal and we would very much like to have some definite answer to the questions that we have asked you. We do not want you to give us the exact size of grates but would like you to give us something near what the size should be.

The grate surface which you are now using is enough for an ordinary up-draft kiln, provided there are sufficient openings in the grates (half of the total area is usual) and three lengths of grates. The grates may be set fourteen or fifteen inches from the ground.

As to the combustion chamber, this is really the arch in the kiln. The furnace proper need be only twenty-one inches higher than the grates. The arch in a kiln, which forms the principal combustion chamber, is usually set fourteen brick high. None of these figures are material, in that they may be varied somewhat either way without seriously affecting the results. The character of the fuel also might necessitate a change from the figures that are given.

It is probable, however, that the trouble is to be found elsewhere than in the furnaces. The method of handling may be wrong. We do not know what method of manufacture is followed nor how the brick are dried. When set in the kiln, the moisture that remains in the brick (even after it comes from the drier) should be removed by firing with wood and at a speed that the ware will stand. When this moisture is gone, coal may be used to complete the burn. From the remark as to the ash, we suspect that you have been running your kiln on too high a draft. As soon as the fire shows thru the top of the kiln, the platting should be "dipped" so as to reduce the draft for settling. The draft may be regulated by the platting and it is very likely that if more attention is paid to this, there will be no trouble in raising the heat.

Used Wrong Acid on Brickwork

746. *Kentucky—In cleaning down the brickwork on the Baptist church, I was sold sulphuric acid instead of muriatic. After the work dried out, there was a milky deposit left on the face of the brick. I tried apple vinegar and soda, also muriatic acid in about five parts of water and then went over the work once more, using clear water. None of these things seemed to do any good. Will you advise me what to do—wire me collect if you know of anything that will take this milky stain off of the building.*

From the description given, it would appear that this reader has made a chemical combination (calcium sulphate) by using sulphuric acid in brick laid with a lime mortar. This calcium sulphate is practically insoluble, as none of the known acids or combinations have any apparent effect upon it. It takes four hundred parts of water to dissolve one part of the compound and it would seem that the only thing that can be done is to let the brickwork stand so that the rain and weather may slowly dissolve the sulphate off of the wall. This will surely happen in time, altho it may be years before the building becomes even fairly clean.

Drying Sheds and Racks for Soft-Mud Brick

749. *Missouri—I am putting in a machine to make soft-mud brick and want to build racks to hold the pallets. What*

George Washington "Built with Brick"

While it is generally known that George Washington was a surveyor, it is also a fact that he was an architect and builder. One example of his architectural ability, as well as of his wisdom in the selection of materials, is a brick house, still standing and in good repair, which was designed and built by him in 1790. It is located in Glasgow, Barren County, Ky., which was a part of Virginia when the house was built. The building is a residence that was designed and constructed by the father of his country for the use of his cousin, General Spottswood, who was governor of Virginia at that time. The walls are of solid brick, 36 inches thick and the floors are of hardwood 2 inches thick, made of chestnut and laid with dowel pins. The original roof was of hand-drawn chestnut shingles, one-half inch thick and these were fastened with wooden pins.

There is not a single nail in the entire building for nails were not manufactured at that time. The glass used in the building was imported from France, as none was made here then, and it is a tribute to the excellence of the glass used as well as to the good bringing up of the youth of Glasgow, that many of the original panes are still doing duty.

I want to know is, can I roof the racks with galvanized iron or is it necessary to roof with lumber?

There is no good reason why drying racks should be roofed with lumber, and there are many reasons why galvanized iron of good quality should be used instead. The latter will wear for many years, without any danger of warping and leaking, whereas lumber will dry out, rot, warp, leak and constitute a constant and serious fire-hazard.

If you have not already built your racks, it would be well to consider the advantages of using soft-mud drier cars, upon which the brick may be placed (on pallets) at the machine. These cars can be run out under the sheds that you are about to build. When the brick are dried, the cars are run out to the kilns and from there, back to the machine.

This method eliminates the handling from the trucks to the racks and back again to the trucks, and there can be no question but that the saving in handling will, in the course of a few years, pay for the cars. Later, if you ever have to consider the question of artificial drying, you will have a full equipment of cars, already paid for.

If it is possible (and it should be) for you to obtain a quantity of used drier cars, the cost will not be so much above the cost of building your racks, as to make the initial investment very heavy.

Wants to Burn All Hard Brick

750. *Kentucky—Would you kindly advise the best type of kiln to build, to make common stiff-mud brick? We only have a small yard (twenty thousand daily capacity) and only run a few months in the year. We would like to get all hard brick or at least a very large percentage of our burn. The kilns that we have were built fifteen or twenty years ago and are square kilns with four furnaces on the side and with combustion chambers. We start them with coke and then use soft nut coal; it takes from eleven to fourteen days to burn them. We would like to build a kiln that would hold one hundred and fifty thousand to two hundred and fifty thousand and one that has large entrances so that we can back a wagon right into the kiln.*

There is no doubt but that the kilns described in the above question are taking entirely too long to burn off and from the description given, it would appear as tho the trouble is almost entirely due to lack of fire-box area. Some of the trouble, on the other hand, may be due to the age of the kilns and to their condition.

In designing a rectangular kiln it makes no difference whether it is to be large enough to hold fifty thousand or two hundred and fifty thousand brick, so long as the ratio between the floor area and the fire-box area is maintained. A small capacity kiln would be just as wide as a large capacity kiln, the difference being in the length. Reference to the article "The Design and Construction of Down-Draft Kilns" in the Sept. 7 issue of "Brick and Clay Record" will give the proper ratios for floor area and fire-boxes and the proper location of the latter.

The SALESMANAGER

Short Stories That May Help the Salesman Who Aspires to Salesmanagership and the Salesmanager Who Wishes to Retain His Ability to Close Big Deals

Quoting F. O. B. Destination

It is the custom in many branches of the clayworking industry to make quotations F. O. B. cars destination, or, where the shipper is a little more careful in his phraseology, "f. o. b. cars shipping point, with freight allowed to destination." The difference between these two ways of expressing what seems to be the same thing, has already been explained in this magazine, so need not be repeated.

The firm or plant that quotes a delivery price (that is, a price on cars at a certain delivery point) has an advantage over the firm or plant that quotes its yard price only. The man who is doing the buying has little time to look up freight rates, weights, etc., and he will, if he can, avoid the additional responsibility that comes of figuring on these matters. He may, as a consequence, be willing to pay a little more for material that he knows will cost him a certain sum, than for material that may cost him a little less and maybe a little more.

But there is an element in making quotations of this character that often escapes the clayworker and his salesforce. It is the fact that the *published freight rate governs* and that the railroads do not, and cannot stand behind any quotation, even tho made in writing, which calls for a lower freight rate than that in the published tariff.

A case recently arose over a claim made against one of the railroads operating in Ohio. Not having a printed tariff covering the destination point in his office, the clayworker called up the local agent, asking for a rate. Word came back "Fifty-three cents, carloads." The local freight agent was asked to confirm in writing, which he did.

The shipments (four carloads) were made, freight collect. The price had been made "f. o. b. cars destination." The contractor paid the freight bills as they were presented, altho they called for a rate of sixty-three cents, instead of fifty-three. The difference between one rate and the other represented nearly all of the profit on the shipment.

The clay plant made a claim against the carrier, presenting the written quotation as a part of its proof. Do you suppose it made any difference? Not by a jugful.

If the railroad company had allowed the claim it would have been liable to a heavy fine. Had the clayworker accepted the allowance, he, too, would have been liable.

It seems that a new wording is necessary in these "delivered" quotations. It might be well to consider this: "Blank dollars per M. (or per ton, as the case may be), f. o. b. cars the plant, with freight at fifty-three cents per cwt. allowed." Or, if that be too vague—"with freight not to exceed so many dollars and so many cents per M. (or per ton) allowed."

Of course, there is always the chance of the contractor or consumer at the other end of the line making an awful row over what he will call the "joker" in the quotation. He will, if he can, make you do all of the gambling. He will also back up his position by saying that you know more about your freight rates than he does. But the fact of the matter is that, if the railroad company makes a mistake which causes you to quote the contractor a lower figure than he would receive had no mistake been made, *you lose.* The railroad company cannot lose—it is illegal. The contractor gains—that is all right. *But you suffer.*

Theoretically, the general contractor on all large structures takes bids, such as your bid on brick or other building materials, and passes it on to the owner, with a certain percentage added for profit. If that were always done, then you would be morally responsible for any figure you might give him, *even tho given in error,* and even tho your low figure helped him to obtain the general contract.

But the fact of the matter is that, having taken figures on all sorts of material (and in many cases guessed at the amount it would be safe to add for profit), the contractor gets the job, and then gets you to figure all over again. *If you can figure lower, all right.* In other words you are bound by your original figure, if it is low. He is not bound to accept it, even tho his successful bid was based upon it.

Selling a Brick Fireplace

The selling of fireplace brick was, at one time, the particular black beast of the face-brick business. We all know of the prominent architect who calls upon us, perhaps for the first time, and who brings with him a client that looks like a million dollars. We also recall how we feel when, instead of telling us that he wants to look at some brick for a big residence, or church, or something like that, he says that he "wants a few brick for a fireplace."

Of course, the business has developed, and fireplaces are being sold *entire*—that is, for a lump sum, with plans and perhaps dampers and other ironwork included. Figured on a per thousand basis, these "ready made" fireplaces bring about $100 per M. brick—which is a fairly good price, even for a face-brick.

But in order to command prices of this kind, the ordinary kind of face-brick salesmanship won't do. One has to understand fireplaces. And a thought comes in, right here—how many face-brick salesmen *do* understand fireplaces?

How many salesmen know, for instance, that boiled linseed oil, applied to the face of the brick with a small paint brush, and rubbed into the joints as well as into the brick, will make that fireplace look about twice as well as it would without the oil? The oil should be allowed to stand on the brick for at least an hour, and then, if it is not all absorbed (it may not be, by a smooth brick) the superfluous oil should be rubbed off with a soft cloth. Otherwise the oil will gum and catch dust. In the case of smooth brick with a very fine surface, two or three coats may be given, and after that, a rub-off once in a while will give the brickwork a soft polish. The coats should be put on, however, not oftener than once in two weeks—give the early coat a chance to go in.

The hearth brick or tile will stand the same treatment and be better for it. The chief thing is to see that all of the oil that is not taken up by the brick or tile in the hour that elapses after it is applied, is wiped off before it has a chance to gum up.

The fact that you *do* know this will help to convince your customer that you know something about fireplaces. For that reason he (or she) may be willing to take your judgment on a very important point, which is that he (or she) can afford to pay from $75 to $100 per M. for a brick that looks very much like one you are offering in carload lots for $20 or $25.

The LETTER BOX

A Place Wherein Our Readers May Give Publicity to Their Opinions on Subjects of General Interest

Fire Safe Houses for Workingmen

Some time since, the editor of "Brick and Clay Record" received a letter from Frances A. Kellor, of the executive committee of the National Americanization Committee, an organization devoting its efforts toward the better housing of aliens. These foreignors are, as a rule, given their first work in this country thru railroad contractors and others engaged in industial efforts that employ large numbers of men in work that takes them to the frontiers of civilization. In reply to that letter, one was sent from this office inquiring what consideration had been given to the fire-safe feature of the structures that were to show these ignorant foreigners that American employers had some thought for their comfort and better ways of living. The answer to this letter is printed below, which bears a date of February 23:

> We have received your letter of February 19, and note your suggestions with interest. The Committee realizes the fact that safety from fire is an important condition in housing plans for industrial towns, and the jury will certainly consider this point in making its awards. The competition is to provide, in part, and in part only, for certain temporary houses for construction gangs, etc. But the point of view of the competition in general is that plans should provide not only adequate shelter for the individual workman and his family, but that the houses that are built around a new industry in a new industrial town must also be suitable to become a permanent part of a permanent American community. It must be remembered, of course, that the houses are designed for workmen earning from $15 to $20 a week. We will send you a statement of the conditions as soon as these are ready.

Every movement that includes a fire-safe propaganda is a movement in favor of burned clay. From what has been written in this matter it will be seen that "Brick and Clay Record" is not too modest to say its say in favor of fire-safe buildings, even tho, in doing so, it may be accused of boosting its own business. The promotion of better, saner buildings is the duty of every citizen, even tho it exposes him to the suspicion of self-interest.

Mr. Poston Replies to Mr. Podolsky

It is regrettable that the correspondence which has so far appeared in these columns in connection with the much talked of question as to "Who Manufactured the First Rough Cut Brick?" should confine itself to the state of Indiana. It may be possible, however, that if the pot is kept boiling some bubbles may arise in the neighborhood of Ridgway, Pa., or perhaps Kane, or some of those other points that for many years claimed priority in the service of wire-cut-face face-brick. At any rate, I. G. Poston, president of the Poston Brick Company, of Springfield, Ill., writes under date of February 21:

> In your issue of February 15, Mr. Harry C. Podolsky goes on record as qualified to speak on the question of

"Who Manufactured the First Rough Cut Face Brick?"

Judging from his statement in your valuable paper, he did not go into this subject very extensively, or he would have found, had he looked up the first and original contract made *in 1904* between the Poston Paving Brick Company, of Crawfordsville, Ind., and the Bonner and Marshall Company, of Chicago, that the same was signed by I. G. Poston, who owned the controlling stock, and who was general manager and treasurer of the Crawsfordville concern at that time.

Mr. Podolsky states that Mr. Gallagher and Mr. Hendrix were the originators of the "Oriental" brick, when, in fact, my brother, C. E. Poston, of Crawfordsville, Ind., was the first person to mention the manufacture of such a brick, and the first to express a desire that such a brick be produced.

I informed him that it could be made, and immediately instructed our foreman, the late Mr. Bruno Weber, to make this brick. Mr. Gallagher and Mr. Hendrix did everything they could to make the undertaking a success, and they were both loyal men to our company, and I do not wish to take any of the credit away from them.

As to the sales end, the late Sylvester Marshall, of the Bonner and Marshall Company, of Chicago, and J. Parker B. Fiske, of New York City, should be given full credit.

Mr. Podolsky also states that my letter, which appeared in "Brick and Clay Record," on January 18, was misleading. I am sure that I had no intention of misleading anyone or of making any false statements. The question at issue is "Who Made the First Wire-Cut-Face Face Brick?" and I leave it to the readers of your paper to decide.

There have been so many opinions expressed upon this subject that it would be well to have it settled. Will any of "Brick and Clay Record's" readers who know of the manufacture and use of face-brick with wire-cut faces, prior to 1904, come forward with the information?

Claims First Rough Face Brick for Buffalo

It would appear that some new light will be thrown upon the question of wire-cut-face face-brick, and that one of these days every one will know who was responsible for the starting of what is sometimes called a "fad." John H. Black of Buffalo, N. Y., writes under date of February 29:

Article by Harry C. Podolsky on the subject "More Light on Oriental Brick" in your issue of February 15 noted with interest.

At the end of his article you put the query, "Who made, who sold and who used the first wire-cut-face face-brick?" I think you can get information on the subject that will be interesting from W. H. Signor of Johnsonburg, Pa., who more than twenty years ago manufactured a buff brick with a wire-cut face, for an apartment house at Main and Utica Streets, Buffalo, known as "The Markeen" and built by a local tailor, Mr. Samuel Laird.

These bricks were used in the first story and for decorative purposes above. My understanding is that these bricks were made at a plant formerly controlled by Mr. Signor at Ridgway.

While this building was constructed some time prior to my connection with the brick business it has been under my notice since its construction.

It would be interesting if a record could be found in the files of the company with which Mr. Signor was formerly connected, as to the exact date of the shipment of the wire-cut-face face-brick mentioned by Mr. Black.

The Group Plan in State Associations

The recent action of the Illinois Clay Manufacturers' Association, in suggesting a group plan to its members, whereby each branch of the industry operating in the state would have a little organization of its own, caused so much comment in other associations, and among clayworkers in other states, that a letter was addressed to A. E. Huckins, secretary of the Illinois association, asking him for further details. Mr. Huckins has written under date of February 24:

Referring to the recent group plan, instituted at the last convention of the Illinois Clay Manufacturers' Association, would advise that it is the idea to get the specific interests so banded together that each and every man in the meeting is talking something which is important to him and his business, either directly or indirectly, every minute the convention is in session.

The various groups have already met several times, and will, no doubt, keep these meetings going. There are many things of vital importance to each industry which could not be well taken up or understood in the association as a whole. One of these is a uniform cost system for the various types of plant manufacturing the same kind of ware, so that costs may be compared with any two or three or more manufacturers who may be particularly friendly. Another is the cost of selling—many minor expenses here can be eliminated. The matter of standard weights of products; the cost of submitting samples and the many unnecessary expenses created by an over-desire to sell any particular job, are equally applicable.

The difficulty with the clay industry, to my idea, is that those who are engaged in it dissipate their entire strength in fighting one another, instead of fighting their common enemies.

There is no knowledge today available as to the quantity of brick sold in any territory, nor the quantity manufactured to supply that demand, nor the stock on hand. No other business is so lax in its methods as to be entirely ignorant of market conditions, and to be continually fighting a shadow.

It is, to my mind, the duty of any manufacturer, no matter how large or how small, to meet with his competitors and talk over sane things along sane lines, and to eliminate the enormous waste ocasioned by obsolete business methods. If rightly followed out and pursued along sane lines, the clay industry can eliminate needless selling expenses and bend its energies to promoting new business. It is impossible to get any more out of anything than you put into it, in one way or another.

I trust that every manufacturer of clay products in Illinois and Indiana will make it a point to get in touch with this association, or, preferably, with the secretaries of the various divisions, so that they will be able to send out the notices of the meetings, as they occur, and insure a big, helpful attendance at each of them. Business goes on, every month in the year, and the work of bettering trade conditions should not be left to the few hours that can be devoted to it at a yearly convention. And when you go to these meetings be sure that you have some well thought out ideas to give to the others, in return for similarly well thought ideas that they will give you.

A. E. Huckins, of the Sheldon Brick and Tile Company, of Urbana, Ill., is chairman of the Face Brick Organization, and Douglas F. Stevens, of the Acme Brick Company, of Cayuga, Ind., secretary. Fred H. Von Oven, of Naperville, Ill., is president of the Drain Tile Organization and D. C. Haeger, of Aurora, Ill., is secretary. Other groups, including the manufacturers of common building brick, paving-brick, fire-brick, hollow building tile and miscellaneous burned clay building materials, will be formed, as the men engaged in their production get in touch with the writer of this letter, who is also secretary of the Illinois Clay Manufacturers' Association, the parent organization, and whose office is at Urbana, Ill.

The movement is not confined to Illinois manufacturers, but is co-operative. Indiana manufacturers are joining those whose plants are located in Illinois, since they, to a great extent, serve the same markets.

There is no expense attached to their group meetings, save as the men who attend them decide to do something that costs a little money. If that is the case, then those who attend know how and why and for what the money is being spent, and that is some satisfaction.

The entire movement is for the betterment of the clay industry of Illinois and Indiana. It will be as far reaching as the men operating in these two states desire to make it. *You are the producers*, and can control the situation, if you work together to that end. It matters little whether you ship a thousand miles, or serve your product only to your own neighborhood. You can and should spent the time to formulate a plan by which you will

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IF YOU HAVE A WANT
Make it known in "Brick and Clay Record's" Classified Columns, and get results.

know what you are doing. The day of independent action has gone by. Co-operation is the life of trade. Competition with your fellow clayworker may sharpen your wits, but it does not help your bank balance!

If a two-cent stamp and a letter will put you in touch with a live wire like Huckins, it is a pretty good investment. He has shown the clayworkers of Illinois the way to make their industry a real leader, and themselves leaders in that industry. Certainly his appeal should stir the sluggish blood of some of those who are still in the rut.

UNCONVENTIONAL CONVENTIONALITIES

Notes Made Behind Enemy Lines by Trained Observers in "Brick and Clay Record's" Aviation Corps

Edmund C. Carr bought a pair of soft yellow chamois gloves to match up with his cane.

Jim Hoskins, of Terre Haute, enjoyed nearly everything at the smoker. Some monocle, Jim.

H. H. MacDonald—he looks at you and no matter who you are, joy rises in him like a harvest moon. First thing we know, someone will compose him into a song.

Solid Scandinavian Woven Reside—who will not wear suspenders—says pulleys and tummys should both be fitted with belts.

Ask any of the Metropolitan paving-brick crowd what sort of a dod-ratted road it is that you build without a curb.

"Daddy" Paul V. Wheeler, who represents the Link Belt Company in northern Ohio, is out gunning for the man who didn't ask him for a loan of his walking stick.

Harry Wells—Paul Belden's general superintendent, took us to Webers—Irene Sproat didn't, so that's why we're mad at I. S.

"Peck's bad boy" had steam up—plenty of it—but for some reason or other only a few capers got out. Just for that we grade him .59.

A. V. Bleininger (for one short week "Bleiny") led them to the Gilsey and led them back again. Who do you suppose paid the bill for that thirsty "Gang 14"?

Clark, of Pittsburgh, was among the missing. S. C. Martin, as usual, purchased the Carolina perfectos for the crowd.

Fat Meddick, of Lakewood Engineering, had in his room a car to put dirt in, and a car to put bricks on—every kind of a car but a self-starter.

Ralph Schory says that his memory is the thing that he forgets with, so Mrs. Schory came along to see that Ralph forgot nothing but work during the visit.

Deny Denmead, the tragedian—he spoke his piece. It had to do with the famous musca domestica and his inability to stand the wintry weather.

Al Angelow came up with four of his men, T. P. Cuthbert, Billy Drayton, R. L. Wilson and A. F. Humphreys. You herded them well, Old Scout.

J. S. McCann, superintendent of the Streator Clay

Manufacturing Company—"they say" that he is a genius, but that's just simply an affair of energy, isn't it?

Frank L. Hopley, the modest violet of Bucyrus and Chicago, is said to have been the author of many of the very clever parodies that were sung at the banquet.

R. L. Clare of Federal Terra Cotta, whose wit ambles and rambles and scrambles, betimes—is a charter member of "Gang 14."

A. S. Reid, of A. S. Reid and Company, of Newark, N. J., and Philadelphia, Pa., said he didn't care who called him "Archie."

R. O. Perrott—hist Watson, the needle—he had that same cigar in his same mouth, at the same tilt. What do you make of it? Does he smoke?

L. G. Kilbourne, of Columbus, Ohio, without whom no brick convention can be called a success, was there to keep "Ben" Fisher in order.

Clarence Hendershot of Cleveland Brick and Clay divided himself into two equal parts, and one-half is now his wife.

M. E. Gregory, of Corning, N. Y., had some difficulty in "getting fitted" to a cane. Gregory's hat is several inches farther away from the ground than most folks'.

"Brick and Clay Record's" information department was busy answering questions about the noticable absence of the King of Ireland. You'll have to come across next year, John.

W. H. Gif4d, of the Cleveland Builders' Supply Company, says names isn't always names—a little Winton, please.

Alfred J. Rogers, of Fiske and Company's Boston office was hailed as "Arthur" so often that he found himself feeling in his pocket for a "Brickbuilder."

D. E. Child made a bet with his brother Leo—a twenty-dollar bet—that his hatred for even one cigarette would last beyond the grave—and that's as far as you will read.

Walter Purcell brought his partner to this convention. You will remember how he failed in this important matter last year. All he did at Detroit was explain why Eddie Grand wasn't there.

J. W. Sibley, of Birmingham, Ala., had a brand new crop of dialect stories, every one good, and every one fit to tell the minister. Where Sibley gets 'em does beat all creation.

C. P. Oudin of Spokane, Wash., came to Cleveland with a pocket full of orders for equipment. As soon as "the word" was passed, the page boys were busy trying to put a Buckeye accent on Oudin.

John W. Anderson, of Mishawaka, Ind., is strong for intensive farm drainage, and consequent bumper crops, despite the fact that all during convention week he had a corner in wheat.

We speak of a man who has served his term as a presiding officer, the "retiring president." Yet how in the world could one think of C. P. Mayer as "retiring" after his story of the cinnamon oil and the better price fever?

If Bob Mitchell, of Farr brick fame, had accepted all of of the new positions offered him while the show was on, he would be drawing more salary than the president of the U. S. Steel Corporation.

Ed. Dow (or Genial Ed., as they call him) has placed at his own disposal a brand new six cylinder "Booic." Say, D.M. of P.E., can we have a couple jobs blowing up tires or polishing the brass?

Jotham Post, of East Williston, L. I., had a pocket full of

THE SAFETY FASTENER
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BELT FASTENERS
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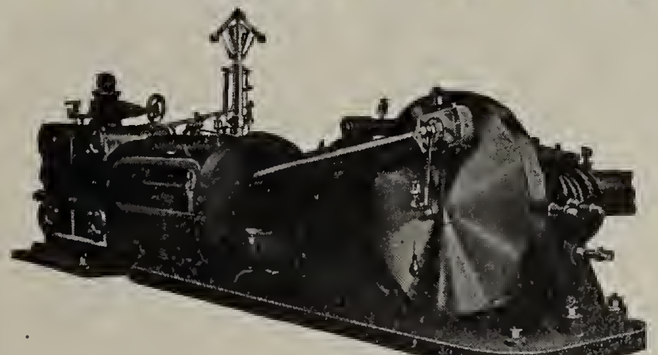
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Use an accurate Pyrometer or burn by the old method. Insist on the accurate pyrometer's adaptation to your needs. Result—Decreased manufacturing cost. Material improvement in product. Write for a copy of "Pyrometer Facts."

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They cut every kind and class of wet clay ware. Face, common and paving brick. Sewer pipe, tile conduit and fireproofing.

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With your Shovel ?
In a hurry ? Must have clay ?
The Beam swings and drops,
Rips and rams
For dipper load—
Swings back—then dumps—
and the chains—"They will not break"
if they're WOODHOUSE SPECIALS
We'll tell you why.
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Perforated Sheet Metals of Every Description
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PERFORATED METAL SCREENS
As required for BRICK MAKERS USES.
New York Office
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Manufactured by
HENDRICK MFG. CO.
CARBONDALE, PA.

leather match-box holders, and a head full of good stories about cull brick and its usefulness in the present craze for "something new and artistic."

Here's a new one on Alphabetical Hollowell. Someone, trying to understand those early initials, spelled his given (?) name Ardeete and wanted to know if that was a nickname for Arthur.

John T. Underwood of Dayton, Ohio, altho of a naturally modest disposition, carries his head high. Not having actual measurements, we guess he stands something over six foot five in his holeproofs.

"Doc" Morrison, of Hamden, Ohio, and Detroit, Mich., was very much in evidence, but found the weather a little too cold for his liking until he was warmed up with one of "Brick and Clay Record's" slap sticks.

B. W. Ballou, of Buffville, Kan., brought 'em right up on their feet with his story of the way the contractor treated the steel man and mistreated the brickmaker. Ballou has the knack of telling his story front end to.

W. P. Varney, manager of the Hydraulic-Press Brick Company's Chicago office, was here, there and everywhere —mostly with F. H. Chapin, the Cleveland manager of the same company.

Warren Griffis, of the Baltimore (Md.) Brick Company, was anxious to know whether there would be any dancing after the banquet. Griffus is certainly "there" with the handy feet.

T. C. Moulding was also among those who were asked for, but unfound. "Joe" was on deck, however, and managed to get around the lobby of the Statler almost as well as he covers the fair green at Edgewater.

H. H. MacDonald spent most of his time at the Complete Building Show, where he wore holes in his larynx talking into a dictaphone. He grew so hoarse, after a while, that everyone thought he'd gone back to smoking cigarettes.

Bob Red Hare had just seven New Orleans sodas in one row; the combined kick in the list made Bob promise an article for the A. C. S. next year on "The Labor Problem in Mexico."

Probably one of the most frequent questions "The Fates of Plymouth" had to answer was: "Where is 'Brick and Clay Record's' headquarters?" Moral—don't wear a red badge.

Charlie Deckman has a great deal of confidence in his fellow brickmen, for he left that loving cup lying around kind o' carelesslike. The younger Deckman generation would have put it to work.

Joe Degenhart, of Buffalo, N. Y., is considerate, above all else. His was the suggestion that Dolben of Boston be left to "watch" the good looking typist in "Brick and Clay Record's" headquarters.

L. E. Rodgers, once of Chicago—but now of Zanesville (which is in Ohio)—treated his friends, new and old, to a glimpse of Mrs. Rodgers. And it was *some* treat. Now isn't he the lucky man?

Carl C. Walters—salesmanager of the Hocking "rugs" had plenty of company, but invariably of the male persuasion. So Walters wore a lonesome look—Mrs. W. is in California.

Elisha K. Kane, of Kushequa, Pa., president of the shortest steam railroad in the country, took active part in many of the discussions, particularly Prof. Orton's paper on the artificial freezing test for common builders.

We all missed the carnations that usually come from the

Dunn Wire-Cut-Lug Brick Company. Someone whispered that Churchill was sick, and that no one in the outfit could present them with the Churchill grace—hence the omission.

That man Richards, from Edwardsville, Ill., has a lot of common sense. His idea of creating a fund is to first find out how much you want, then go after it. He hates all of this uncertainty.

William Hammerschmidt, the brick and tile maker of Lombard, Ill., complained when they offered him one of the twin-bed outfits at the Statler. Hammerschmidt requires a full sized sleeping outfit.

Can you name a new criss-cross, diamond, diagonal, basket-weave brick? Do you want to earn a new silk hat, a silver-mounted cane, a sterling cigarette case, or make your own contract and ask T. P. Cuthbert, of the Fallston Fire Clay Company, Pittsburgh, Pa.?

When it came to getting canes for Haigh and Hopley there was an awful time. The longest were too short and the shortest too long. After some debating it was agreed to take two medium sized ones, and then trade them off with others that had secured misfits.

J. W. Lazear, of the Brown Instrument Company's Chicago office, must be writing a play. Many times and often was he seen by those who cared to look, dictating something or other to the blonde (?) stenographer across the hall from the pyrometer exhibit.

C. H. Bryan, of the Mercier-Bryan-Larkins Company, of Detroit, sprained one of the tendons in his right foot while threading the mazes of the corridor and balcony at the Statler. "Brick and Clay Record's" cane came in mighty handy.

T. P. Cuthbert, of Fallston and Pittsburgh, Pa., made good his threat to turn a part of the company's capacity on rough-face face-brick, even tho he had called the wire-cut-faces "a menace to the face-brick industry." Incidentally, the new texture is a dandy.

Will P. Blair was as interested in the N. B. M. A. convention and meetings as he is in those of his own association. He had lots of company, too. Charlie Deckman in the president's chair took us back to Dayton and Buffalo. If "Mac" had only read a paper, the picture would have been complete.

Three guesses as to the identity of the good-looking, gray-haired gentleman from Terre Haute—the one who always carried that yellow cane and saw that all the boys were in bed before ordering his own ice water (excuse, please—the Statler has running ice water in each room).

George Frid, of Hamilton, Ont., president of the Canadian National Clay Products' Association, was down with a large and enthusiastic bunch from the other side of the border. Frid believes in the "hands across the lake" idea and lives up to his belief.

Miss Astrid S. Rosing (middle name "Service")—said to be the only woman actively engaged in the clay products business, managed to get a little pleasure and some profit out of the convention. No wonder they have equal suffrage in Illinois.

"Prof." Bleininger says that we hear a lot about the Cr. E.'s who do not make good but that, taken on the average, graduates of ceramic schools make more successes in life than do the graduates in probably any other line of scientific endeavor. Ask "Prof."—he knows.

Looked like old times—just as many face-brick men around as there used to be when there wasn't any face-brick association. They all looked pretty much the same as ten years

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Do you know positively when your kiln has reached and sustained for a sufficient length of time—a maturing temperature?
A Price Pyrometer furnishes absolute information.

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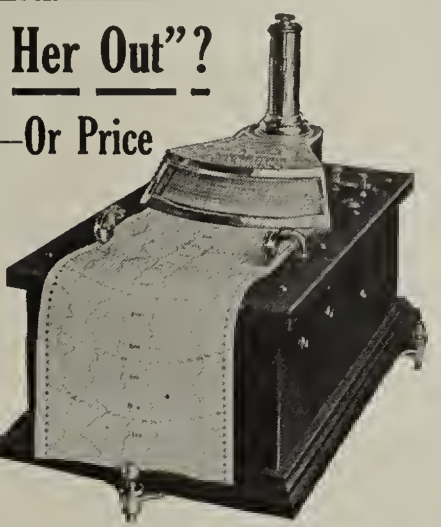

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—we know this without asking you because you will get a reduction if you install the
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It certainly is to your interest to let us talk this over with you—we will prove our claims.
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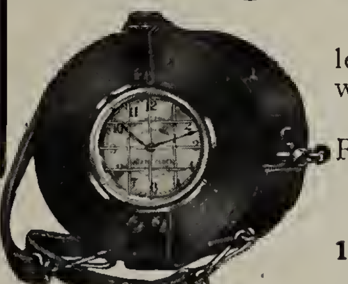

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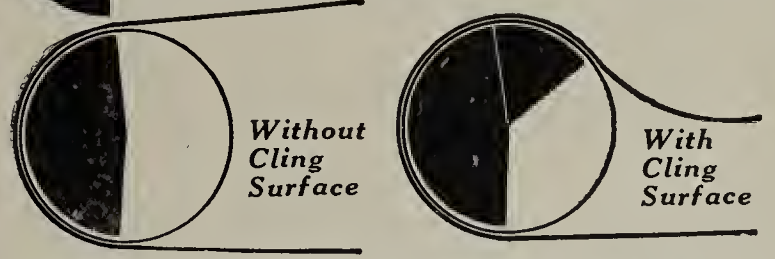

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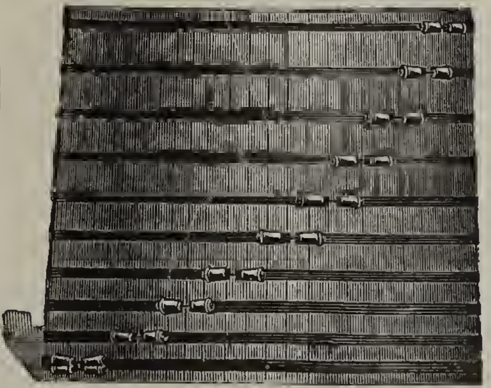

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Drier Doors That Hold the Heat
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"Carrier" with One Door Lifted.

Perfected Dry Kiln Door Carrier

Doors can't warp or get out of shape—easy to operate—only one carrier needed for each battery of doors.

Made for doors from 2' to 8' wide and 5' to 8' high. Made for wood or fireproof construction.

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COAL For All Ohio Clay Plants

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This coal will save you money, you burn less to get better results more easily. Inquire now from

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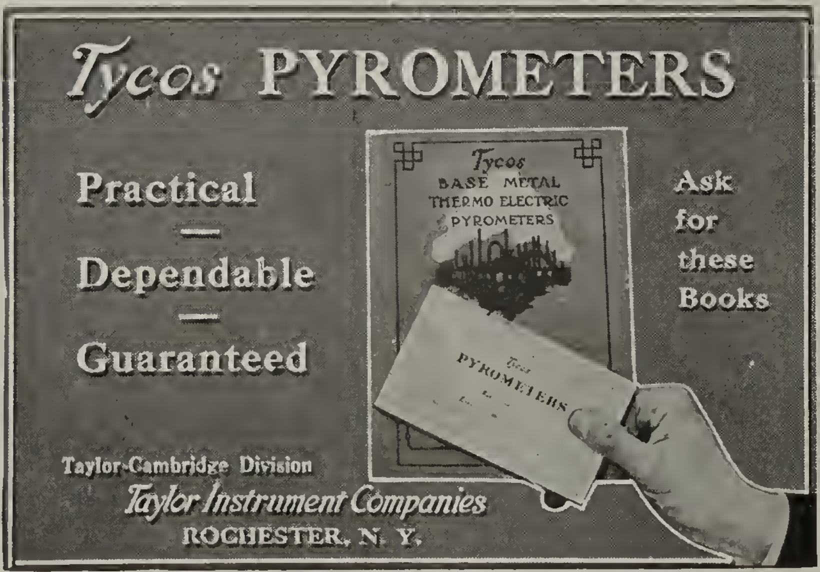

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Practical — Dependable — Guaranteed

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Taylor Instrument Companies
ROCHESTER, N. Y.

ago, too—Kilbourne, Fiske, Hanley, Hamilton, Sibley, Snyder, "Ben" Fisher and all.

"Rex" Gardner, Harry Podolsky, "Chick" Bonner and Fred. Dolben led in the hymn-singing the night the convention closed. Some village choir!

It doesn't pay to ask for plain water at the Statler bar. Ask Tubby Hall and Gail Truman. You will know them by this description—slightly stout, red-headed, baby-blue eyes, bald behind the ears and with a noticeable list to port—both sailors.

Charles T. Harris, secretary of the Hollow Building Tile Manufacturers' Association, worked like a bee in a clover patch. There is a prize offered to anyone who ever saw Charlie stand still on one spot for more than thirty consecutive seconds.

J. S. McCannell, of the Milton (Ont.) Pressed Brick Company, was accompanied by the charming partner of his joys and sorrows. The war is hitting the McCannells very hard, their oldest son being in training to become an officer in the army that Canada is sending to the front.

Claude C. Blair, of the Bessemer Limestone Company, elected president of the National Paving Brick Manufacturers' Association at the Dayton meeting, had a crowd around him all the time, until some one wanted to know if the N. P. B. M. A. president had a Secret Service guard like Woodrow Wilson.

Charles A. Millar, past president of the Canadian National Clay Products Association, told so convincing a story of the way the Provincial Workmen's Compensation Act was working, that many of our manufacturers wished certain legislation along that line on this side of the border had so many sensible points.

They offered Ray Stull all sorts of money to come back to Illinois University, but, like the tiger that has once tasted human flesh, "Prof" has found the commercial side of the clayworking business very much to his liking, and he don't want to go back to school. It looks as tho Frank Dunn knew a little something about "Buying Well."

James A. Hogan, of the well known vaudeville team of Binyon and Hogan, asked the hotel clerk at what hours the meals were served: "Breakfast from seven to eleven, luncheon from eleven to three, dinner from three to eight, and supper from eight to eleven," recited the clerk glibly. "What th' ——— what time will I get to see the town?" said Hogan.

Homer F. Staley of the Iowa State College stood his ground while he was being "heckled" by some of the hollow-tile manufacturers who did not agree with the Iowa idea. One of them asked Staley how it was that the silage did not freeze in the top of the silo and, before Staley had an opportunity of answering, added that "it does freeze." Staley answered: "I don't know why it doesn't but the fact of the case is—it don't." Some difference of opinion there.

A. F. Greaves-Walker of the Sun Brick Company, Ltd., Toronto, Ont., whom his Canadian friends will insist upon calling a "budding author" was there with his whole family, mother, wife, sisters, sisters-in-law and some others. Being an efficiency expert, he found time to attend all of the A. C. S. meetings, as well as those of the N. B. M. A., entertain several luncheon parties (including one given to Prof. Orton) and to put a few finishing touches on his continuous kiln article which will appear in the March 21st issue of "Brick and Clay Record."

C. E. Foster, of Bradford, Pa., says they left him his health and a sunny disposition.

A. R. D. Johnson, of Raleigh, N. C., is another alphabetical immortal like Ardeete.

Dwight E. Humphrey qualified as an expert blaster. What he don't know about explosives isn't worth setting a fuse to.

Fred. Kanengeiser has applied for a place in the list of "budding authors" on "Brick and Clay Record" and was unanimously elected to honorary membership.

H. B. Henderson, in telling of a twenty cat-power 4d that nearly knocked him down, said !!!!!::***??? and then some other things we can't print.

R. C. and L. W. Penfield showed up-to-date form at the dance after the banquet. Wonderful how those new dances hit the prominent citizens.

T. H. Swan, of Rochester, N. Y., looks fat and prosperous. Says he manages to get three squares a day and enough to eat, even if the market is all shot to Canajoharie.

Gordon C. Keith, secretary of the Canadian Clay Products Manufacturers' Association, astonished everyone—even himself—by delivering an original poem at the banquet.

F. A. Hoiles, of Alliance, Ohio, spread out a few "rugs" on the floor of his room at the Statler, and then held an informal, but unceasing reception for about three days. No one knows what time he went to bed.

OVERHEARD *in the* ELEVATORS

"Step back in the car, please."

"Let's go up to Gibson's room and get a cane."

"Third floor—all off! This is the real convention."

"What's the matter with the 'smokerette'?" "Nothing—this Cleveland bunch couldn't see the fun in chocolate cigars."

"Yes, sir—the biggest registration in the history of the N. B. M. A.—even beats Chicago."

"Bert Luten's wife? How in the world did that ornery cuss ever get her to take him? Gee, he's some salesman."

"Call this 'Statler Service'—why man, I wrote for a reservation a month ago, and now I've got to sleep in the same room with Dan Reagan."

"That's Miss Rosing—she sells hollow-tile and sewer-pipe in Chicago. Sure—has her own business *and runs it.* Didn't you see her picture in 'Brick and Clay Record'?"

"Let's go over to Schuster's—we can get a good steak for three of us for four and a half." "Fine—but where in —— Cleveland are we going to get the four and a half?"

Seemingly somewhat mixed, despite the lack of stimulant at the smoker he said: "I forgot my glasses and for the life of me, I couldn't tell if they were bronzes or bluenettes."

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DRYING ORIGINAL Boss SYSTEM BURNING
The Boss Ten Hour DRYER | The Boss System of BURNING BRICK
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JOHN C. BOSS COMPANY
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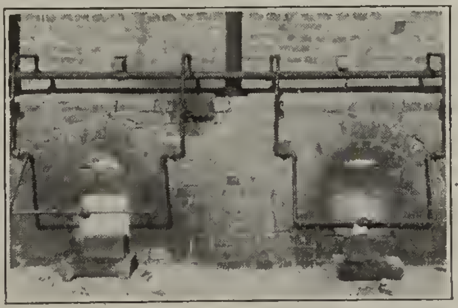

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WITH
LESS OIL
USE THE
SCHURS
Over 20,000 in Use
WRITE US
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LOS ANGELES, CAL., U. S. A.

The Semi-Monthly Trade Review

LIKE THE CALM before the storm, or the lull in the cannonade which precedes the attack in a battle, so the first week in March—so far as the demand for clay products is concerned—is a pause in the year's occupation before a busy season. With few exceptions this analysis of the situation seems to be verified in the nation's cities both large and small.

Beginning with New York City, which is the barometer for a certain section of the Atlantic Coast, it is found that brick dealers are "riding" from their stacks to fill orders instead of going into the open wholesale market to buy, even tho the price there is from fifty cents to a dollar per thousand lower now than a month ago. The price quoted by most of the Hudson River manufacturers on March 1 was $8.50 per thousand.

The reason for a slowing up in demand on the New York market is that an inventory of the brick available in the Hudson River sheds, now being made, is showing that stocks are larger than was generally thought. Yards like Washburn's, Sudderly and the Empire Brick & Supply Company have been burning brick now and then all winter, which has increased the available supply about 135,000,000. It is estimated that there is now between 500,000,000 and 550,000,000 brick up the river. But even tho the present price is somewhat weaker than it has been, it is still $1.50 higher than that which was prevailing a year ago at this time.

The easy condition of the money market in New York is permitting a number of old building operations to go ahead, so that construction work which has been held in abeyance for a year or more, is proceeding, resulting in a tremendous demand for all building materials. In the Raritan River district, firms like Sayre & Fisher are making a nominal quotation of $9.00 on red brick and are not seeking business pending the resumption of deliveries now held back by heavy ice and the scarcity of barges.

LOOKS LIKE BUSY SPRING IN CHICAGO

In Chicago, as an indication of the early spring building season, marked by operations on a large scale, permits for the week ending February 26 were $2,140,240 in value as compared with $1,499,300 the preceding week, and $1,023,200 a year ago. Real estate sales are also showing a large increase over the same period in 1915 and the building trades are more than ordinarily active.

Boston reports a confident feeling that activity in spring building will be very pronounced. Operations and the demand for brick and other materials during the past few weeks has been interfered with by unfavorable weather.

The outlook for building and contracting in Philadel-

"Bolt It to the Bin"

The Columbus Feeder

for automatically feeding

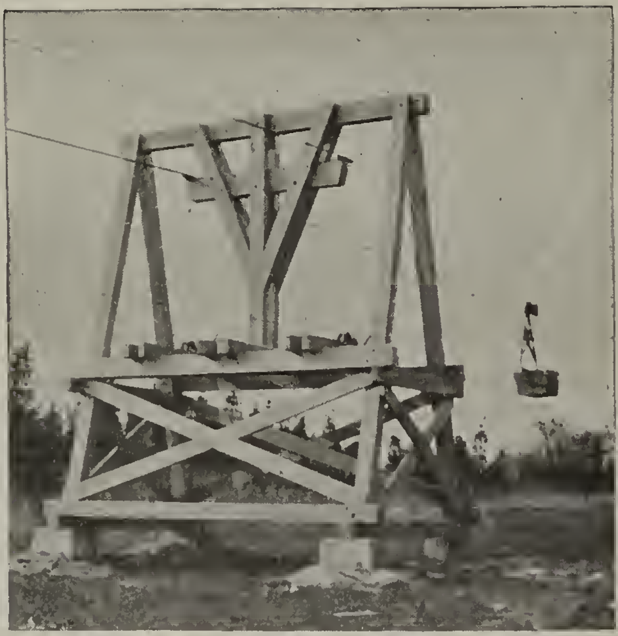
Crushed Clay to Dry Pans *and* Pulverized Clay to Pug Mills

is fast coming into general use. There's a reason. Let us show you—furnish the machine on trial.

Send for Circular.

Ceramic Supply & Construction Co.
Columbus, Ohio

If the Grade is Sufficient—Gravity Supplies All of the Power



B. & B. Friction Grip Aerial Tramway

requires only one man to operate it, will work regardless of bad weather, any capacity desired. It is perfect in construction, simple to operate, maintenance cost is low. Outline your haulage conditions and we will gladly estimate the cost and possible savings to you.

Ask for Catalog No. 16.

BRODERICK & BASCOM ROPE CO.
New York ST. LOUIS, MO. Seattle

phia is very encouraging and points to a large demand for brick and other clay products with the advent of open weather.

The larger building projects in Pittsburgh have, in some cases, been held back by slow deliveries of material. Building permits for the first half of February made but an indifferent showing, but an early improvement is certain since a large amount of work is now being figured by architects.

Building operations in Wilmington, Del., are above normal for this time of the year, while there is a noticeable expansion in real estate and building operations in Baltimore with an upward tendency in material prices.

Contrary to the usual lull in building as seen in other cities, the weather during the last week in February was very advantageous to outside work in St. Louis. Plans for improvements and new structures are being made on a large scale by local architects, so that a substantial volume of work is anticipated as soon as the weather settles.

The season for building is drawing near in Cincinnati and the outlook seems better than for the past two years. Cleveland building operations are on the increase, the volume of permits for the year so far being far ahead of last year's corresponding period. Mild weather is helping construction quite materially. Building operations are continuing active in Detroit, particularly in the way of new factories and office buildings. Minneapolis, Minn., Grand Rapids, Mich., and Lincoln, Neb., report building and real estate as being very active.

Los Angeles, Cal., real estate transactions show signs of revival and favorable indications are in evidence for an increase in building operations during the coming spring.

GENERAL BUSINESS CONDITIONS STILL IMPROVING

Altho it is hardly conceivable how general business conditions could be improved in many quarters, commodity prices are still on the rise. Coupled with this ascension in values has come a scarcity of raw materials which further tends to strengthen prices. It is significant that domestic requirements are taking precedence over foreign business in iron and steel. Current buying is of extraordinary volume and tho output is at a high tide, productive facilities are still being overtaxed.

From the signs that are being hung on all sides, it looks very much as tho preparedness is going to play an important part in the prosperity of the clay plant owner during the coming spring and summer. Much has been said here and elsewhere regarding the national building "boom" that was sure to come and many words have been spent in urging manufacturers to make the necessary improvements and increases in plant capacity.

You can well imagine yourself in the trenches now with the Army of Good Business approaching armed to the teeth. If you have plenty of machine guns and large calibre artillery—the symbols of a well-equipped plant and an efficient organization—you will be able to take care of any onslaught that this army may make. But if not, you are simply going to be overwhelmed.

All The News Worth While
About the N. B. M. A. Convention
will be found in the
March 21 Issue

BALDWIN

You want a reliable, economical locomotive for service about your plant. Investigate the **Baldwin gasoline locomotive.**

These locomotives are reliable, because they are correctly designed and built. They are economical, because they consume no fuel while standing idle.

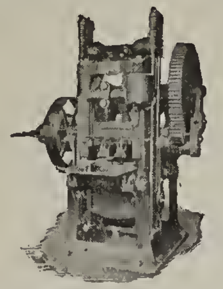
Record No. 74, which is yours for the asking, tells all about them.

THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA, PA., U. S. A.

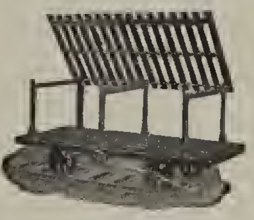
WHATEVER equipment you need—don't buy until you know something about the

Lakewood Line

We Manufacture



Buckets, Kiln Bands, Pressed Steel Brick Pallets, Bearings, Portable Track, Ball Bearing Turntables, Switches, Richardson Double Die Steam Represses, also Miniature Hand Represses.



Cars of all kinds

Every piece of equipment is built of the best material by the best mechanics obtainable. The Lakewood Line is Built to Last.

Ask for Catalog No. 11

Lakewood Engineering Co.
Formerly the Ohio Ceramic Eng. Co. Cleveland, Ohio

LOAD BORE HOLES
With Low-Freezing
DU PONT
Quarry Powder
A New, Powerful, Quick-Acting Explosive
Especially Made for Winter Work

THIS explosive meets the requirements for an "all-round" powder for clay pit work. It has the low-freezing property which makes the thawing of explosives seldom necessary, even in a near zero weather.

Insist that all blasting be done with DU PONT QUARRY POWDER or low-freezing explosives introduced and made by the pioneer powder makers of America.

ASK FOR NEW AND INSTRUCTIVE BOOKLET ABOUT EXPLOSIVES AND METHODS OF USING.

E. I. DU PONT DE NEMOURS & CO.
Powder Makers Since 1802
WILMINGTON, DEL.

LEHIGH PORTLAND CEMENT CO.
LEHIGH
ALLENTOWN, PA.—CHICAGO, ILL.

Paving Contractors

who use Lehigh Cement for base, filler and grout on all brick paving work

Know Exactly What the Results Will Be

They know that a given proportion will give uniform results in every part of the work and that there need be no guessing as to strength, or uniformity or fineness. Prompt deliveries always.

LEHIGH
CEMENT
Cement Grout for Permanence

IN *the* WAKE *of the* NEWS

Being Brief Mention of a Host of Interesting Happenings in the Varied Fields of Clayworking

PERSONAL

T. T. Armstrong, the senior member of the Armstrong Manufacturing Company, of Hicksville, Ohio, is enjoying the winter in Southern Florida.

Frank Beauclair, formerly of Mineral City, Ohio, has been made assistant superintendent of the Louisville (Ohio) Brick and Tile Company's plant.

E. M. Neiswanger has recently purchased the Fairfield (Iowa) Brick & Tile Company's plant, which, it is said, is one of the best equipped clay plants in Southern Iowa.

John Palmer, an officer of the United Fire Brick Company, of Uniontown, Pa., died on February 22, at his home in Pittsburgh, Pa. Mr. Palmer was seventy-three years of age.

Joseph Taylor, formerly superintendent of the Southern Fire Brick and Clay Company at Montezuma, Ind., has resigned to accept a similar position with the Far West Clay Company of Tacoma, Wash.

E. R. Sturtevant, superintendent of the Abingdon (Ill.) Clay Company, was recently elected president of the newly formed Abingdon Community and Commercial Association—a local "booster" organization.

E. C. Carr has resigned as manager of the Metropolitan Paving Brick Company, Canton, Ohio, and will in the future be connected with R. L. Beck, a prominent building supply dealer of Cleveland.

P. B. McConville, formerly with the Hydraulic-Press Brick Company of Washington, D. C., has been appointed the Washington representative of the S. B. Dobbs Company with offices in the Colorado Building.

John H. Farris is a new salesman connected with the Brazil (Ind.) Brick Company. Mr. Farris was formerly identified with the Brazil Gas Company but has given up that work to sell face-brick in southern Indiana and Illinois.

John L. Green, president, and Richard D. Hatton, general manager of the Laclede Christy Clay Products Company, of St. Louis, were visitors at the plant of the Alsey (Ill.) Brick & Tile Company, on February 24.

Cornelius D. Howell, who was identified with the Purington Brick Company and a former president of the Illinois Brick Company, died on February 20 at the Evanston (Ill.) Hospital.

William J. Pope recently completed a quarter of a century of service in the employ of the Robertson Art Tile Works, Morrisville, N. J. Mr. Pope joined the company

on February 2, 1891. He was the first man employed by them and has been in their service ever since.

Col. J. B. Wilson, manager of the Star Clay Company of Mertztown, Pa., recently gave a banquet to all of the company's salesmen and to twenty-one representatives of eleven eastern railroads over whose rails the company's products are shipped. Col. Wilson was toastmaster.

W. H. Battey, formerly with the Standard Vitrified Brick Company at Coffeyville, Kas., has accepted a position as superintendent of the Western Shale Products Company (formerly the Fort Scott Brick and Tile Company) at Fort Scott, Kas.

John J. Prew, a brick manufacturer of Holyoke, Mass., died on February 18. For twenty-one years Mr. Prew was the owner of a brick plant located near that city, producing from three and one-half to five million common brick a year.

After a vacation extending over a period of five weeks, Thomas Eadie, manager of the Eadie Building Supply Company, Kansas City, Mo., has returned to his desk rejuvenated and ready for work. Mr. Eadie says that the prospects for a large sale of brick are very bright.

CALIFORNIA

The Coleman Brick and Lime Company of Santa Barbara, Cal., has been incorporated by W. H. Coleman, O. E. Miller, M. Johnson and D. O. Kelley.

An increased demand for brick in San Francisco is anticipated from the action of many property owners who are now cleaning up old ruins and removing many foundations which have been covered by wooden shacks since the earthquake and fire of 1906. It is believed that a great many owners will soon build on this vacant property.

The Carnegie Brick and Pottery Company, located at Corral Hollow near Stockton, Cal., was recently sold at public auction for $35,000. George R. Chambers, bidding for Gladding-McBean and Company of San Francisco, was the purchaser. The property consists of seventy-five acres, including a brick plant, sewer-pipe plant and a terra-cotta plant.

Building has increased in Stockton, Cal., and nearby towns to such an extent that the present stocks of common-brick are about exhausted. The San Joaquin Brick Company, the principal source of supply for that district, had only 750,000 brick left in its sheds during the latter part of February and, judging by the way in which these were being shipped, it is believed that there will be a shortage before the plant resumes operation.

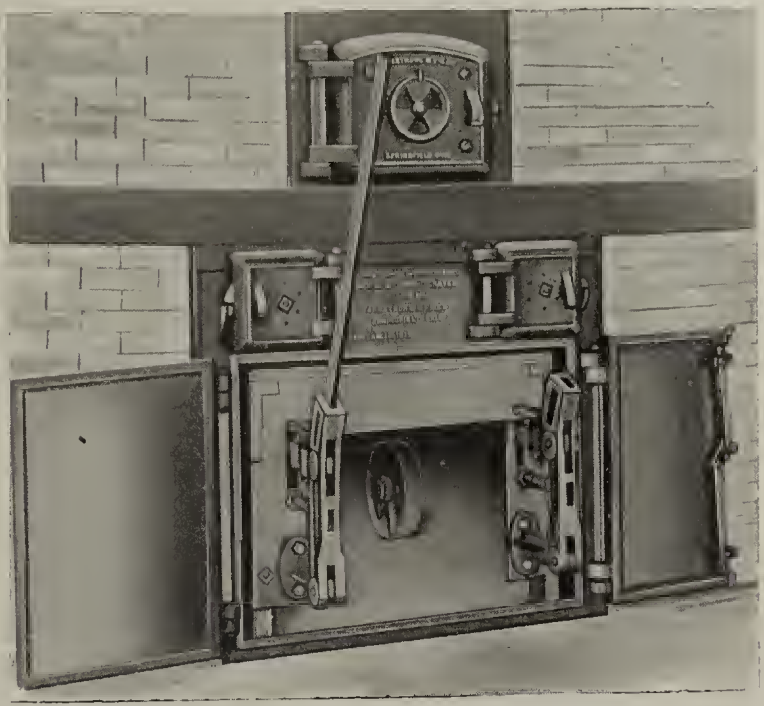
CONNECTICUT

The price of brick in Connecticut has advanced again during the past few weeks, having now reached the highest point since 1907, according to local dealers. Sales are being made at $11.25 per thousand and it is considered very probable that a still further advance will be recorded before the yards are all in operation again in the spring. New factories are being erected in many parts of Connecticut and the surrounding states, creating a heavy demand for building brick.

DISTRICT OF COLUMBIA

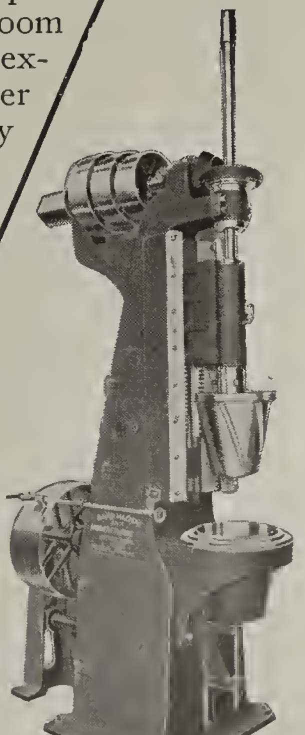
The District Tile and Brick Company is a new concern in Washington, D. C., which has been formed for the manufacture of face and common-brick and hollow-tile. Roy W. Miltenberger, for many years Washing-

Armstrong Kiln Grates
Portable—Interlocking—Self-Contained
Shaking—Dumping
We will ship our Standard Interlocking Kiln Grate to any clay plant anywhere, install it at our own expense—if it is not satisfactory or does not give better service than any other kiln grate, we will remove it —and it won't cost you one cent.
It Will Positively Reduce Your Burning Costs.



We want to tell you more about these grates.
The Armstrong Manufacturing Co., Springfield, Ohio

A bi-product that is profitable
Place the machine off in one corner of your plant, and let it absorb the spare time of your machine room men. They soon become expert, and a stock of flower pots quickly collects, ready for the kiln.
It is almost pure velvet—a bi-product—a sure seller with a manufacturing cost low enough to insure a goodly profit.
Send us sample of your clay and let us show you what our flower pot machine will do.
Baird Machine & Mfg. Co.
54-56 Jefferson Ave.
Detroit, Mich.



BRISTOL'S HIGH RESISTANCE ELECTRIC PYROMETERS

EQUIPPED with high grade Weston milli-voltmeter movements with platinum platinum-rhodium couples for temperatures up to 3000 deg. F. The milli-voltmeter movement is of **pivot jewel-bearing type** which is comparatively rugged and especially adapted and used extensively to control kiln temperatures.

Write for Catalog 1400

THE BRISTOL CO., WATERBURY, CONN.

BRANCH OFFICES BOSTON CHICAGO PITTSBURGH NEW YORK SAN FRANCISCO

Give Your Samples A Fair Chance

You select them carefully don't you? Well then pack them safely and attractively and they'll work for you.

H & D Corrugated Fibre Boxes

will deliver brick unbroken and unchipped and save you money, time and trouble besides. They are inexpensive, light, resilient, strong. They come folded flat, are easy to pack and unpack and **they certainly do prevent breakage and chipping.**

Write for sample.

The Hinde & Dauch Paper Co.
Sandusky, Ohio

ton representative of S. B. Dobbs and Company, Philadelphia, is manager of the new concern. The plant, which was formerly operated by the Hugh Phillips Company, is located at Stott Station, Md., just outside of the city limits, while the offices are in the District National Bank Building, Washington. The old plant has been thoroly overhauled and three more kilns have been built.

GEORGIA

W. Mercer Morris of Columbus, Ga., now has under consideration plans for the resumption of operations at the old plant of the Southern Brick and Terra Cotta Company, east of Columbus.

After being idle for two years, it is announced that the brick plant owned by Charles A. Harris of Macon, Ga., will soon be re-opened. This resumption of operations is occasioned by unusually bright prospects in local building for the coming spring and summer.

ILLINOIS

The Alton (Ill.) Brick Company started 1916 operations on March 1 with a sufficient number of orders on hand to keep the plant running thruout the year.

The Hamilton (Ill.) Clay Manufacturing Company held its annual meeting on February 16, the following officers and directors being elected: A. W. O'Hara, president; C. P. Dadant, H. S. Harrison and H. M. Elder, vice-presidents; O. C. McCartney and Earl Wood, secretaries, and Jacob S. Palmer, treasurer.

The Utica (Ill.) Fire Brick and Clay Company has been incorporated with a capital stock of $60,000 by George I. Deitrich, George J. Gleim and Ernest A. Gleim. The company owns a fire-brick plant at Utica which will be operated from the present time for the remainder of the year at a daily capacity of 40,000 brick. In addition to the manufacture of fire-brick, the company will mine and ship clay.

The Belleville (Ill.) Brick and Tile Company will soon file a protest with the Illinois Public Utilities Commission and the Interstate Commerce Commission against what it claims are discriminatory freight rates. Belleville manufacturers are placed at a great disadvantage, according to Warren W. Ittner, president of the company, because of the high freight rates which prevail in comparison with other cities in the state.

The Kankakee (Ill.) Brick and Tile Company now has plans under way for the erection of an additional plant at its pit to have a daily capacity of ten carloads of hollow-tile and drain-tile. When the new plant is placed in operation, which will be some time during the coming summer, the company will have a daily capacity of about two hundred and fifty tons of ware. Between $80,000 and $90,000 will be expended on the new plant.

In the February 15 issue of "Brick and Clay Record" it was announced that a new $40,000 brick and tile plant was soon to be erected at St. Anne, Ill. The promoter of the new company, it was stated, was Fred H. Meier, formerly president of the St. Anne Brick and Tile Company. For some reason or other the company has not been organized, and now Mr. Meier announces that he has purchased land and a site for a brick and tile plant at Crete, Ill.

INDIANA

The building inspector of Indianapolis, Ind., announces that permits issued in 1916 to date exceed those of the corresponding period last year by $30,000.

"Business is getting back to normal in Indianapolis," according to J. H. Zinn, of the William E. Dee Company.

"Prices for all building materials have advanced on an average of about thirty per cent, and there is much business in sight."

J. W. Van Wert, of A. B. Meyer and Company, brick dealers, in Indianapolis, Ind., reports that the local demand is improving and that the outlook for a busy season is bright, because of the large number of new buildings that are contemplated.

The Brooklyn (Ind.) Brick Company will resume operations at its remodeled plant on March 10. This plant was closed for several weeks while new machinery and other equipment was being installed which will raise its daily capacity to 100,000 brick. The plant will operate to capacity for some time to come, as several large orders are waiting to be filled.

KANSAS

The Western Shale Products Company, M. M. Bushong, general manager, has taken over the Fort Scott (Kas.) Brick and Tile Company's property, and will build a new plant, with fireproof construction thruout.

The Ottawa (Kan.) Brick and Tile Company's plant will be busy thruout the year according to one of its officers. It is expected that a contract will soon be closed by the company for furnishing brick for the paving of both First and Ninth Street in that city.

KENTUCKY

The city of Maysville, Ky., will pave a considerable portion of its streets with vitrified brick during the coming year. The time for receiving bids covering this work closed on the evening of March 6.

A half interest in the Hill and Karnes Brick Company of Paducah, Ky., has been purchased by W. H. Buhlinger of St. Louis, Mo., from Michael Karnes. Frank Hill, the other partner of the old concern, retains his interest and the plant will in the future be operated under his management and that of Mr. Buhlinger, who assumes the position of secretary and treasurer.

MARYLAND

The Mayer Brick and Tile Company, of Frostburg, Md., has been organized with a capital stock of $50,000, of which $25,000 will be preferred and $25,000 common stock. Henry Mayer, G. Dud Hocking, R. A. Walter, F. H. Schrieber and H. V. Hesse are the incorporators. The new company will rebuild a plant which was destroyed by fire in August, 1914.

MASSACHUSETTS

A certificate of incorporation has been issued to the newly organized Berkshire Brick Company, a concern organized by J. H. C. Church, Charles H. Booth and T. Ellis Ramsdell, all of Great Barrington, Mass. The new company will acquire the plant of the Berkshire Composite Brick Company and its main office will be at Cheshire, Mass., with the plant located at Medfield.

The New England Brick Company is making extensive improvements at its plant in Cambridge, Mass. The entire plant is practically being rebuilt and when the work is completed about April 1, its capacity will be doubled. A steam drying system is being installed and two new 150 ft. drying sheds erected, also a machine shed 50x100 ft. and a power house about 50 ft. square. With the new equipment it is proposed to operate the plant the entire year.

MINNESOTA

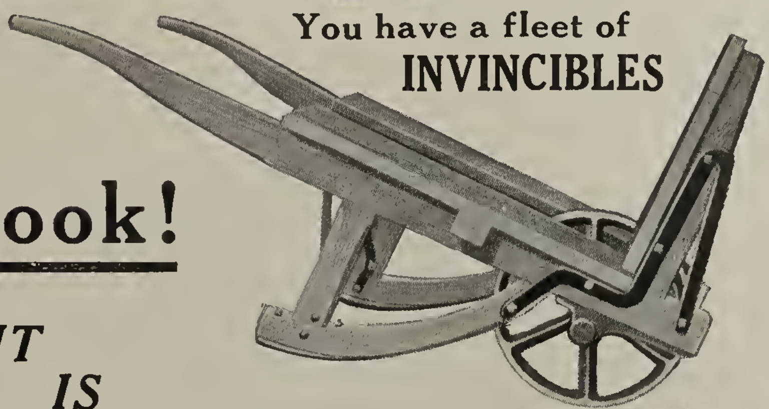
Brick will, in all probability, be selected as the material with which Grand Avenue from Twenty-eighth to Fifty-

But—You Can't Do It!

You can't get the kilns unloaded on time—You can't prevent accumulated demurrage on cars—You can't have satisfied hustling wheelers—

UNLESS

You have a fleet of
INVINCIBLES



Look!

IT IS BALANCED

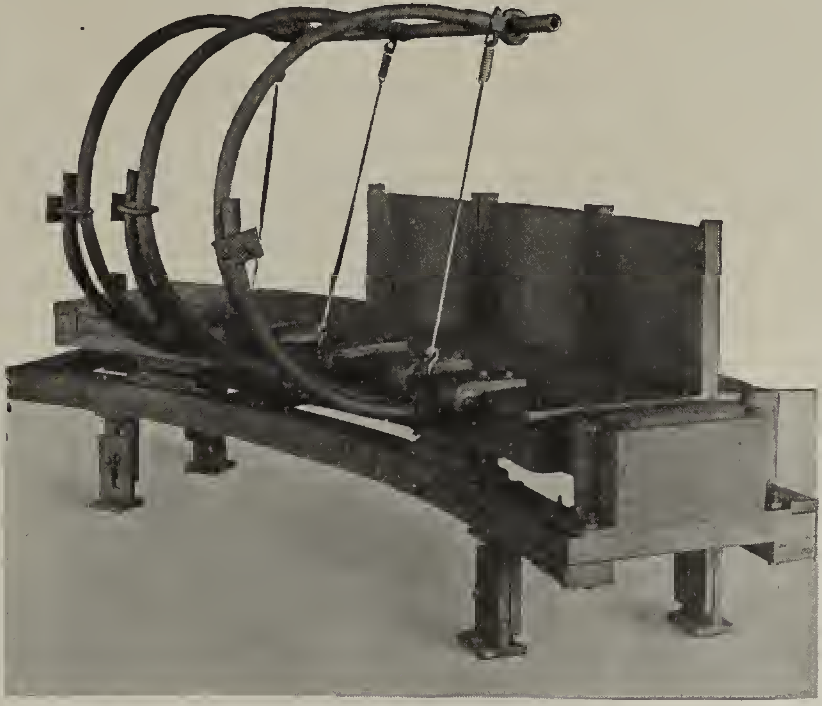
The axle is **under** the load—NOT at one end of it.

It slides—down the runway—and the hind legs don't rip and tear.

It Rides Its Load

THE TORONTO FOUNDRY AND MACHINE CO.
TORONTO, OHIO

New Silo Block Cutting Table
Cuts Radially



Sioux City (Iowa) Brick & Tile Co. writes as follows:
"Beg to advise we have run about 50,000 blocks since receiving the table. It works very satisfactorily indeed. Will gladly recommend the machine. By using the lever to shift the table back to its original position after the cut is made, one man has no trouble operating it."

Bulletin G-25 is ready.

It's costing you money to be without modern equipment.
Don't call it expense—just an investment.

Made in Brazil, Indiana—The Clay Product Center
CRAWFORD & McCRIMMON CO.
Estd. 47 yrs. BRAZIL, IND.

There is a man—

a manufacturer of fireclay products; he has used Canton Kiln Grates for four years.

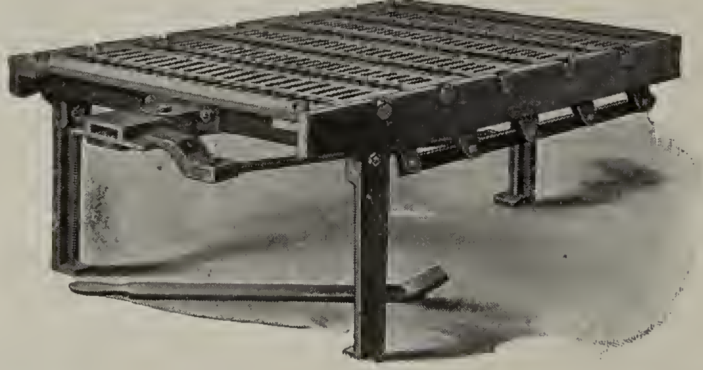
This man saved 30% of his burning costs each year in the first three years.

Today, in the fourth year, he claims and is accomplishing a saving of—40%.

Are you neglecting an opportunity? In all fairness to yourself, to your trust, to your company—is it right for you to any longer neglect an investigation of Canton Kiln Grates?

We have dozens of sets in kilns. We will furnish you a set on a trial basis.

Write that letter to us—now.



The Canton Grate Co.
1706 Woodland Ave.
CANTON OHIO

HETTRICK RED STITCHED CANVAS BELTING

For Conveying—Transmission—Elevating

is the very best belt for the clay plant that it is possible to make. All possible stretch is removed, oil processed and red dressing applied, then cured before it is sent to you. Write now for facts and prices.

NO BETTER BELT CAN BE MADE

HETTRICK CANVAS BELTING BEATS THEM ALL

HETTRICK BROS. CO.
TOLEDO, OHIO

fourth Avenue, Duluth, Minn., will be paved during the coming summer.

An interesting development of the past month has been the organization of the Lowry-Smith Company, of Duluth, Minn., to succeed Dixon and Lowry, an old established building material concern. Among other commodities, the new company will handle brick, wall and floor tile.

The Corning-Donohue Brick Company of St. Paul, Minn., has been incorporated with a capital stock of $50,000 and will begin at once the erection of a warehouse, the site for which has already been purchased. The new company was formerly the Corning Brick Company, the reorganization being occasioned by the entrance of J. H. Donohue, Jr., into the firm. Mr. Donohue was formerly connected with the Belt Line Brick Company of Minneapolis. The company will manufacture common and face-brick, also tile and sidewalk brick at its plant to supply a market in the Northwest.

MISSOURI

The Hydraulic-Press Brick Company, of Kansas City, Mo., has secured an order for supplying the face-brick to be used in the new Overland Automobile Company's building in that city.

The St. Louis (Mo.) Refractories Company has been incorporated with a paid-in capital of $200,000 to engage in the manufacture of clay and manganese products. It will specialize in grain magnesite and silica brick. The plant will be located at Columbia, Ill., near St. Louis where the company has more than eighty acres of land. The crude manganese ore will come from Lower California. The company has mine contracts with California companies for as much of the raw material as will be needed. C. J. Crawford is president of the company; R. E. Laidley, vice-president and J. A. Dewes secretary and treasurer. The general offices will be on the tenth floor of the Times Building in St. Louis.

MONTANA

A plant equipped with modern machinery for the manufacture of building brick, paving-brick and drain-tile will soon be built at Glendive, Mont., provided natural gas can be obtained for fuel, which now seems a certainty. It is reported that a concern now located at another point and possessing all of the necessary machinery for the establishment of a plant such as is proposed, is anxious to locate at Glendive. Tests have shown that a good quality of clay is available.

NEBRASKA

A deal involving several thousand dollars and the consolidation of two large Nebraska brick plants was made public recently when Emil Polenske signed a contract with Doed Smith for an option on the latter's third interest in the Polenske and Schellak Brick Company, of Hastings, Neb., the consideration being $34,735. Mr. Smith's interest will be transferred to A. A. Lembach and Hugo Polenske. Mr. Lembach, who is at present visiting in Kentucky, is expected to return to Hastings about March 15 when papers will be drawn up for the consolidation of the Polenske and Schellak and the Polenske Brothers brick plants. The consolidated companies will then be incorporated under a new name.

NEW HAMPSHIRE

The board of public works of the city of Manchester, N. H., has contracted with William F. Head and Son of Hooksett to furnish the city with brick for the year.

NEW JERSEY

The Crabb Clay Products Corporation, of Millington, N. J., is one of the new yards that has started to do business in this, "the year of activity." C. W. Anness is in charge.

The old Berkley Brick Company's plant at North Plainfield, N. J., has passed out of litigation that lasted for almost a year and is being put into working order by Ernest T. Hand of Plainfield. The plant will be operated at a capacity of about 75,000 common-brick a day after May 1. Mr. Hand has acquired the title to Stony Hill, a rich clay deposit located in the outskirts of the city, and will discard the old machinery and oil-burners, returning to the original method of burning, using wood.

NEW YORK

The Bradford (N. Y.) Shale Products Company is the name of a newly organized company which contemplates the erection of a large and modern brick plant. The company has already obtained its charter and the capitalization is said to be $100,000.

OHIO

The Hanover (Ohio) Brick Company has been incorporated with a capital stock of $50,000.

After a month's shut-down, during which considerable new machinery and other equipment was installed, the plant of the New Lexington (Ohio) Press Brick Company resumed operations the latter part of February.

J. C. Kline, of the John Kline Brick Company, of Wickliffe, Ohio, writes that business is not so good this year as it was last. He adds, however, that his company has overhauled its power equipment, installed two new 150 H. P. boilers in a new boiler house, and built a 90-ft. stack.

The Carbon Brick Company, recently incorporated at Youngstown, Ohio, with a capital stock of $50,000, will operate a plant in Lawrence county, Pa., just over the Ohio state line. The incorporators of the new company are J. B. Malloy, Harmon T. McCartnew, H. H. Howalt, J. Boshim and E. Wright.

As an aid in the development of brick sales, the Hydraulic-Press Brick Company has established at its Cleveland office an efficiency department of which W. R. Scott, a graduate of the University of Michigan, will have charge. The object of this department is to assist architects in working out designs in brickwork and decorative tile.

The Louisville (Ohio) Brick and Tile Company has added hollow building tile to its output, making 5x8x12 blocks weighing about 15 lbs., and 5x4x12, which weigh 7 lbs. These are being made with the auger brick machine. This plant turns out a varied line of clay products, including drain-tile, silo-block, common-brick and hollow building tile, as noted.

H. C. Kramb of the Kramb Brick and Tile Company, of Oak Harbor, Ohio, writes that business prospects are very good and that his plant has recently completed the installation of several kilns of modern type. He adds that his company expects to go after the brick business that is to be obtained in the vicinity of Oak Harbor, and to do some advertising to create more business than is at present in sight.

E. F. Armstrong, manager of the Armstrong Manufacturing Company, of Hicksville, Ohio, says that business is fair, altho stock is not moving as readily as it did this time last season. His company will install electric motors, new clay feeders and new elevators, and expects to build a new dry-shed, 40 by 60 ft., with three floors. Waste heat will be used, with fan draft.

You can get a higher price for your brick if you guarantee it will be

Scum-Proof

And you can do this with perfect safety by using

R. H. Precipitated Carbonate of Barytes

It neutralizes the salt in your clay so that it cannot appear on the surface of the brick after it gets wet.

But don't accept a substitute—insist on R. H.—the dependable brand.

Write for circular and prices.

The Roessler & Hasslacher Chemical Company
100 William St. New York

Chicago, Ill. East Liverpool, O. St. Louis, Mo. Kansas City, Mo. New Orleans, La. Philadelphia, Pa. Boston, Mass.

We carry a complete line of high grade chemicals for the clay industry

$1350 Buys a Dewey

"Let the DEWEY Do Your Work"

And no matter how much more you might pay, you wouldn't get anything better—dollar for dollar. The Dewey is far ahead of any other locomotive on the market. Let us prove it—a card will bring the truth.

DEWEY BROS., Goldsboro, N. C.

The Kiln That Pays

The Improved Hook Patent Up and Down Draft Kiln

burns with a uniform hardness throughout

The following is a letter in proof of our claims:

Mars, Pa., Feb. 25, 1916.

To Whom It May Concern:

We have installed in our 30-ft. kiln the **Improved Hook Patent Up and Down Draft System**, and are convinced that it is the only system by which brick can be burned as hard at the bottom as at the top, in less time and with less fuel.

Since our burn in the first kiln, and the burn giving satisfactory results, we have decided to erect another of the same kind, as the **Improved Hook Patent Up and Down Draft Kiln** has every advantage over our former kilns.

Mars Brick & Tile Co.
Per Chris Gelbach.

We are doing it for others, and can do it for you. **Let us prove our claims.**

For further information address

Ohio Kiln Company, Vigo, Ohio

Tank and Silo Equipment

We buy Glazed Tile Silo Blocks and sell Wood Tanks with steel towers for their elevation. You serve yourself by telling us what you have to sell and we open Opportunity's Door, showing you wherein each may be served in silos or tanks. Both are needed by every *Manufacturer and Stockman* and their installation means profit to live builders and contractors. Open up—tell us your occupation or trade—a clam never gets anywhere! We have propositions that may interest you.

Kalamazoo Tank & Silo Co.

Ft. Worth, Texas Kalamazoo, Mich.

More than nine miles of brick paving to be laid during the present year is being planned for the territory surrounding the re-born city of Dayton, Ohio. President C. F. Brenner of the board of county commissioners is in charge of the work. The commissioners have already applied to the state highway commission for authority to do the work with the assistance of the state. It is estimated that the new pavement will cost approximately $181,200, half of which expense will be paid by the county and half by the state.

OKLAHOMA

D. E. Collins, of the El Reno (Okla.) Brick Company reports business as being exceptionally good. His company has installed an electric hoist and trolley for loading, and intends to build a number of houses for its employes.

PENNSYLVANIA

D. Warren DeRosay, general manager of the Corry (Pa.) Brick and Tile Company, reports business good—says it is the "best in ten years."

Will H. Miller, secretary of the Dunn Brick Works at Erie, Pa., reports business as being dull at present, with indications, however, of a busy spring.

The plant of the Glen-Gery Brick Company, Shoemakersville, Pa., is now working overtime. The company has secured an order for 3,000,000 brick which will keep the plant busy for some time to come.

The Reading (Pa.) Shale Brick Company is planning to add to its capacity in the near future by the installation of new machinery and other equipment. During 1915 ten million brick were made at this company's plant and it is expected to double this output this year.

A. D. Kayser, of Webster & Kayser, of Philadelphia, Pa., writes us that his concern has refused orders for more than three million common-brick, on account of having no stock on hand. He adds that all of the yards in Philadelphia are sold out for at least the next three months.

D. A. Greenawald, manager of the Schuylkill Pressed Brick Company, of Schuylkill Haven, Pa., reports that the year just closed has been the best in the history of the company. The present year opened very favorably and the plant is running full time. The officers of the company are: H. L. Daddow, president, St. Clair, Pa.; John P. Ryan, secretary and treasurer, Pottsville, Pa., and Daniel A. Greenawald, manager, Schuylkill Haven, Pa.

In order to prevent, insofar as it is possible, personal injury to their employes, Hyzer and Lewellen, Philadelphia (Pa.) fire-brick manufacturers, have recently installed many safety devices at the plant. This action has come as a result of the death of Ernest G. Henry, an employe, who was killed in the company's power plant. Altho the coroner's investigation found that the firm was entirely blameless, in order to prevent a repetition of the accident, J. W. Lewellen, manager of the plant, has had a guard placed around the engine.

H. Watson, General Manager of the Eureka Fire Brick Works of Mount Braddock, Pa., writes us that the business condition is the best in the history of the plant. A motor-driven repress has been installed and a mile of new tramroad built. A new clay mine has been opened from which Kittanning soft clay is being taken. At the present time an addition is being built to the dry floor which will give three thousand square feet of additional drying space and tests are being made of the product so that this company may be in line for by-product coke oven business.

RHODE ISLAND

The plant of the Ashaway (R. I.) Brick Company, which has been idle for the past four years, has been sold to a new company and will be reopened in the early spring. A number of improvements are to be made in the property and the equipment put in first class shape.

TEXAS

The Groesbeck (Tex.) Brick Company has been incorporated by C. S. Bradley, R. L. Underwood, Dan Parker and C. C. Frampton with a capital stock of $17,000.

The Mexia (Tex.) Pressed Brick Company has filed an amendment to its charter increasing its capital stock from $30,000 to $35,000.

The Fraser Brick Company of Dallas, Tex., has just contracted to take over practically the entire output of two other Texas plants, using the added equipment for the manufacture of interlocking tile. The Wichita Falls Brick and Tile Company and the Star City Products Company of Elmendorf, Tex., near San Antonio, are the plants involved in the new arrangement, which will give the Fraser Brick Company an annual capacity of more than 30,000 tons.

The Texas Railroad Commission, which has been holding hearings at Austin recently, did not increase the rates on stoneware, earthenware and pottery as requested by the railroads. However, a new tariff was issued as a result of these hearings, which is merely a readjustment of the rates on the commodities mentioned therein and applies on carloads and less than carload shipments. The new tariff became effective on February 25.

VERMONT

The Hartford Brick Company has started to operate a plant at Hartford, Vt., where it will manufacture both brick and tile.

WASHINGTON

It is rumored that the Little Falls Clay Company's plant near Centralia, Wash., which was destroyed by fire about two years ago, will soon be rebuilt.

The American Fire Brick Company, of Spokane, Wash., has received a contract for the manufacture of 100,000 firebrick for the Export Lumber Company, of Harrison, Idaho.

Drainage Conference at Urbana

March 8 to 10 has been set as the time for an important gathering at the University of Illinois, Urbana. An excellent program has been prepared for a conference which will include talks and addresses on all phases of the drainage question. Many notables, including state and city engineers, not only of Illinois but of adjoining states, together with the vice-president of the Illinois Central Railroad and government officials will speak.

This conference is called for the purpose of stimulating general and technical interest in drainage, flood protection and the reclamation of swamp and overflowed lands in Illinois. It is also to constitute a forerunner of an annual short course on these important subjects from which all interested may obtain more complete instruction.

Manufacturers of drain-tile are particularly invited to attend this conference as it involves matters of considerable importance to their interests.

THWING HIGH RESISTANCE MULTIPLE RECORD
PYROMETERS

During the annual conventions of the American Ceramic Society and the National Brick Manufacturers' Assn., we had on exhibition a series of Thwing Instruments.

Scores of visitors came and saw the actual and practical demonstrations, and were strongly impressed by the three big outstanding

Thwing Features:
Accuracy and Simplicity
Ruggedness

For brick and hollow ware plants these features are imperative.

We have dozens of our instruments in clay plants that are giving perfect satisfaction, proving better than words our claims of accuracy, simplicity and ruggedness. Thwing installations pay for themselves within a few months in the saving of fuel alone.

Write now for more and complete data
to

Thwing Instrument Company
437 North 5th Street
PHILADELPHIA PA.

Sixty-Five
Hook Kiln
Installations
In this One Section of Ohio

In that section of the state bounded by lines running north and south—and east and west thru Columbus, Ohio, there are **65** plants that have contracted for and are using

The Hook Kiln

They are burning brick, drain tile and hollow block in a marvelously short time and with a greatly reduced coal consumption.

We can not offer a better testimonial than this, for nothing could be more convincing.

Ask today for complete information.

The Hook Patent Kiln Co.
Vigo, Ohio
Canadian Office: 250 Dufferin St., Toronto, Ontario

MACHINERY *and* EQUIPMENT

Descriptions of Machinery and Accessories and Detailed Announcements That Our Advertisers Believe will Interest Our Readers

"Brick and Clay Record's" Advertisers and Their Displays at the N. B. M. A. Convention

One of the most striking evidences of the greatly increased buying activity in the clay products industry was the large number of manufacturers who were represented at the N. B. M. A. convention to tell the clay people of the superior merits of their wares. Several of them had from six to a dozen men there, all of them as "busy as bees."

Nor were prospective buyers lacking. Never before has there been shown such an earnest desire on the part of the clay products people to know more about the scores of machines, equipment and methods our advertisers have been exploiting thru the columns of "Brick and Clay Record." They showed much enthusiasm, and their apparent familiarity with the various advertisers' offerings indicated clearly that they had been reading "Brick and Clay Record" advertising.

The American Clay Machinery Company seemed to have mobilized the largest army and they were "at home" to old and new friends in the spacious parlors on the second floor of Hotel Statler. Their new machines—those "thorobreds"—were the subject of much favorable comment, while Mr. Haigh was kept busy telling of the accomplishments of the kiln that bears his name. The company enhanced its present popularity by presenting to brick men a leather bound diary and a road map. Its representatives were H. C. Penfield, L. W. Penfield, R. C. Penfield, L. Haigh, F. L. Hopley, Ed. J. Shaw, H. S. Simpson, R. O. Perrott, C. B. Sharer, Davis Brown, Jas. P. Martin, Hallis B. Crum, W. R. Cunningham and Williams H. Merkel.

The Arnold-Creager Company of New London, Ohio, was kept in the forefront by its representatives, J. T. Aten and Frank McClellan, who were very busy telling of their latest product in soft-mud brick machinery.

Representatives of the Bonnot Company of Canton, Ohio, were kept busy telling their friends of that fine new addition to the plant they are just completing, which will give them a greatly increased capacity and facilities to execute orders with 100 per cent efficiency. There was also much interest displayed by clay men in this company's latest designs of pug-mills which are being built in various sizes to meet special demands. A. A. Oldham, secretary-treasurer of the company, was ably assisted by Roy G. Smith, G. C. Stoll and H. A. Carter.

The H. Brewer Company of Tecumseh, Michigan, was represented by G. S. Brubaker, and his headquarters on the third floor were never wanting for interested brick men. The other members of this company were compelled to remain at home on account of the large volume of orders the factory is working on.

Room 1034, Hotel Statler, was the mecca of scores of ceramists and clay-products manufacturers to extend greetings to W. D. Richardson of the Ceramic Supply & Construction Company of Columbus, Ohio. Of course the Richardson Producer-Gas-Fired Continuous Kiln, first announced in the columns of "Brick and Clay Record," was the object of greatest interest. But the other products of this progressive concern were also discussed with much favor, and both Mr. Richardson and H. C. Arnold, secretary, were given but little rest for five days.

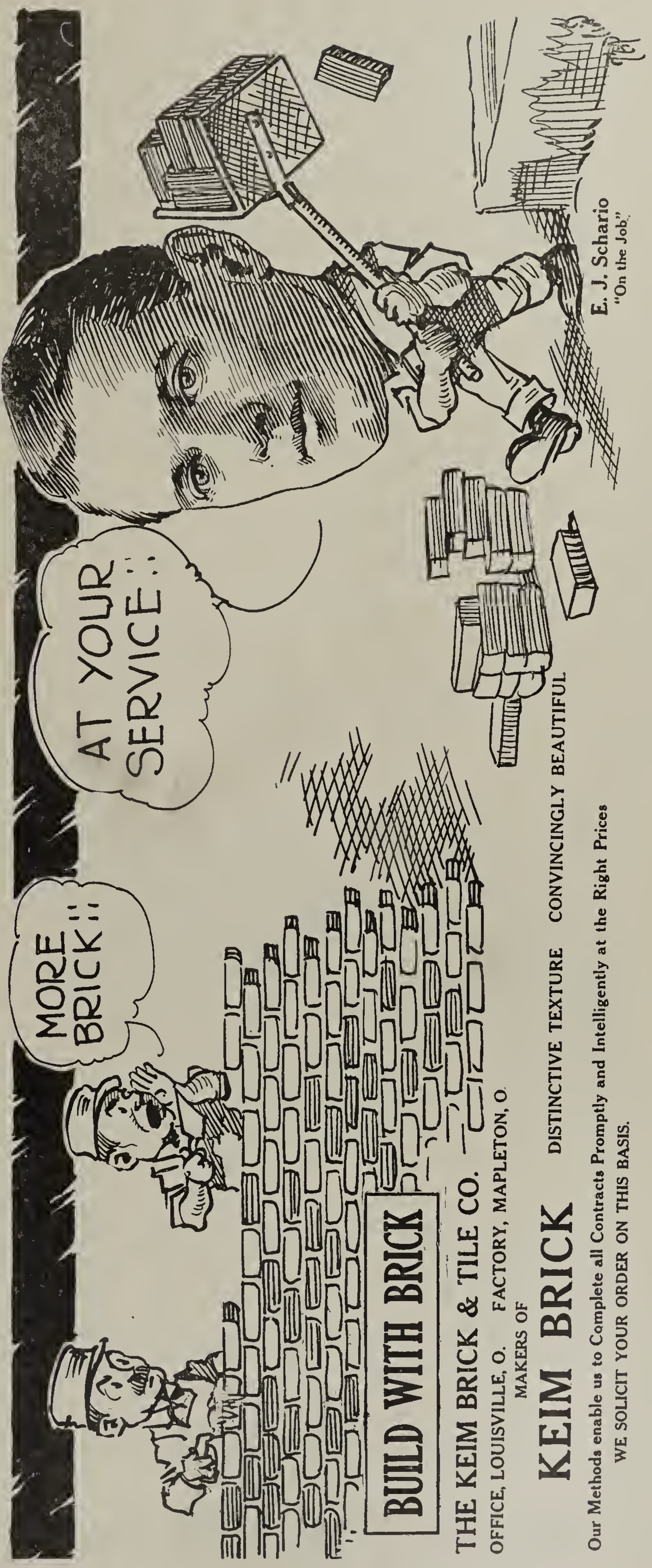
Chambers Brothers Company extended its greetings to old friends, and welcomed the new, thru its usual standbys: J. Howard Chambers, president, and A. R. Root, special representative. Brick men always seem especially keen to learn of the improvements to "tried and proven" Chambers machines, hence these gentlemen were constantly holding reception.

Chase Foundry & Machine Company held forth in Room 312, where they displayed the "chassis" of one of their drier cars to show its wearing qualities. A. J. Dunn, H. S. Swinehart and F. A. Fleming ably represented this well-known company.

Wherever you saw anyone with a large red badge with red and white rosette, and the words: "Ask Fate of Plymouth," you knew he was one of those hustling representatives of the J. D. Fate Company of Plymouth, Ohio. They occupied a suite of large rooms on the third floor next to "Brick and Clay Record" headquarters, and the walls were decorated with photographs of their machinery installations, and the now famous Plymouth Locomotive, also blue prints of the new machines this company has recently designed. They presented callers with a very fine rotary pencil sharpener which was much appreciated by every recipient. Their representatives were Harley H. Fate, Geo. B. Drennan, H. R. Sykes, H. J. Votaw, Geo. A. Anderson and Fred S. Haltz.

E. M. Freese & Company of Galion, Ohio (D. M. of P. E.) held a constant reception in their suite on the fourth floor, and they didn't have a dull moment. Their representatives, A. J. Freese, G. R. Hess, E. L. Hess, B. E. Place, H. F. Place and Ed. W. Dow, were constantly busy repeating to callers the merits of Freese machines. They presented each one with a very useful bill fold and card case.

The Manufacturers Equipment Company of Dayton, Ohio, headquarters on the third floor, was the "first to begin and the last to quit" every day of the A. C. S. and N. B. M. A. conventions. Their "advance agent," W. H. Sachs, secretary, had a splendid exhibit ready early Monday morning, and it was well that he did because the crowd came early and they kept coming. Naturally, the greatest interest was in the accomplishments of the Underwood Producer Gas Burning System, and considerable enthusiasm was aroused by the actual exhibits offered as evidence. These consisted of pavers and face-brick burned by the Underwood System, burning charts to show control of heat, and figures taken from the books of those who have installed this system, to prove the great saving of the Underwood method over direct coal firing. There was also much interest aroused in the fact that J. L. Schroll, president, I. M. Justice, vice-president, and J. T. Underwood had just come from Akron where they had won fresh laurels. Of course the Justice Drier and the general equipment of the company were also much discussed, and with great favor. Callers were made happy also when presented with a very useful card case with


MORE BRICK!!
AT YOUR SERVICE!!
BUILD WITH BRICK
E. J. Schario
"On the Job."

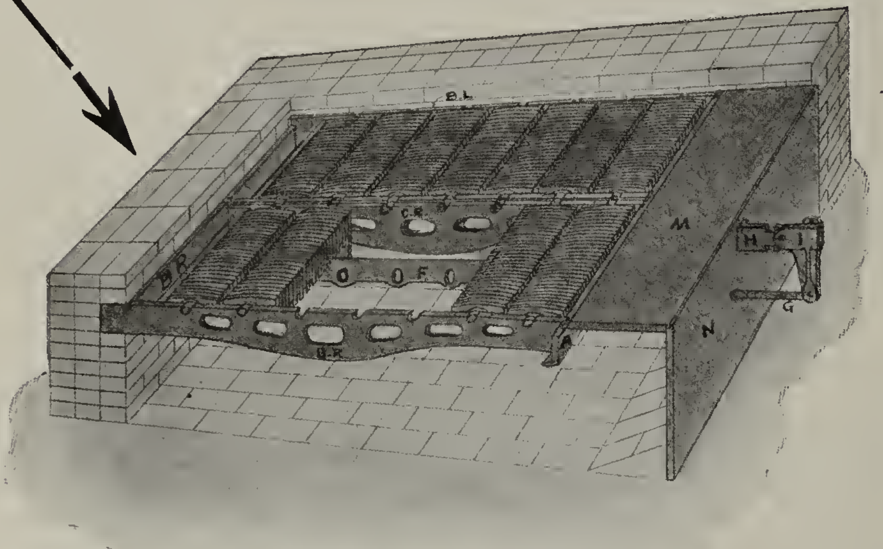
THE KEIM BRICK & TILE CO.
OFFICE, LOUISVILLE, O. FACTORY, MAPLETON, O.
MAKERS OF
KEIM BRICK
DISTINCTIVE TEXTURE CONVINCINGLY BEAUTIFUL
Our Methods enable us to Complete all Contracts Promptly and Intelligently at the Right Prices
WE SOLICIT YOUR ORDER ON THIS BASIS.

BRICK PLANTS
Are Installing
CYCLONE GRATES

Not only because they are sold on ninety days' trial, but principally because in practical every day use they have proven their right to these claims:

1. Even distribution of draft.
2. No fuel gets into ash pit.
3. Locks level.
4. Burns cheap fuel.
5. No fingers to burn off.
6. Impossible to warp.

Isn't This the Kind of Grate You Want?



We can afford to sell the Cyclone Grate on 90 days' trial because of our confidence in our ability to make good on all our claims.

Why not write for our complete catalog?

CYCLONE GRATE-BAR CO.
BUFFALO, N. Y.

loose leaf memo sheets. Besides those named above, this company was also represented by E. M. Mahlmeister, treasurer, J. W. Worrall, general manager, J. C. Harris, Geo. W. Nushaw and A. H. Kramer.

Marion Machine, Foundry & Supply Company of Marion, Indiana, was represented by Robt. A. Young and M. B. McFeeley. They had a display in the Exhibitors' Room where they met old friends and made many new ones. They were kept especially busy telling of the wonderful accomplishments of the "Rust" Feeders, now considered an indispensable equipment of every modern clay plant.

Geo. J. Potts very ably took care of the host of friends of C. & A. Potts & Company of Indianapolis. He was kept busy at his table in the Exhibitors' Room explaining why Potts' machines are dependable.

The Stevenson Company of Wellsville, Ohio, down in the "heart of the clay industry," had its popular president there—Chas. G. Stevenson. He was well seconded by likable Thomas A. Hibbens and S. Abbott. They were constantly busy telling of the triumphs of Stevenson pans and presses. They also made each caller glad when they handed him a flexible leather combination bill fold and card case.

The Wellington Machine Company had busy headquarters in Room 324, where Roy C. Bennett, D. J. Strickland and H. S. Bennett were happily telling why so many soft-mud brick manufacturers continue to use the Wellington product. The 60,000 daily capacity machine was much discussed and with great favor—as was also the Wellington System of pipe rack drier. Visitors were presented with a steel tape measure—very practical and acceptable.

Lakewood Engineering Company showed their usual enterprise by exhibiting one of their new model steel clay cars, besides some of their other drier and clay-plant equipment. There was never a dull moment in Room 329. Its representatives were C. F. Lang, W. A. Meddick, Henry Pleines, T. Maley, L. R. Wilson and J. W. Mosel.

Paul V. Wheeler, Cleveland representative of the Link-Belt Silent Chain Drive, had a model of this now famous product so visitors could see its advantages. Numerous photos also were shown illustrating installations in scores of clay plants, and great interest was aroused. Mr. Wheeler presented each caller with a folding steel mechanic's rule enclosed in a leather case.

The Beighlee Electric Company of Cleveland, representatives—W. H. Chappell, W. O. Little and W. H. Gibb of Pittsburgh—had an exhibit of their complete line of electric pyrometers, showing the inside workings, and methods of installation on clay plants. The Beighlee recorder was the object of especial interest, but even more so was their automatic compensating device, an exclusive feature on Beighlee instruments, and which has seemed to appeal favorably to clay-products manufacturers.

The Brown Instrument Company showed commendable enterprise in its exhibit of a complete line of electric pyrometers, including a new recording instrument capable of making eight records at one time. It also showed draft gauges of the differential type, and various other heat measuring appliances for portable or stationary use. The exhibit showed a careful study of the needs of brick, tile and pottery plants. Besides J. P. Goheen, salesmanager, those in attendance were J. W. Lazear, G. L. Clapper and R. J. Funk.

"The Ultimate Pyrometer" headquarters—Room 346—had a very complete and interesting exhibit of Heraeus La Chatelier Pyrometers—the products of Charles Engel-

hard of New York. R. W. Newcomb of that company kept "open house" and talked "Thermo-Couples" for many hours each day. The accuracy and long life of these well known instruments were plainly demonstrated in the display. Mr. Newcomb was ably assisted by A. L. Terry of the same company.

Dr. C. B. Thwing of the Thwing Instrument Company had a very excellent display of this company's indicating and recording pyrometers that have become so popular in the clay industry. Much interest was displayed by visitors in the recorder whose outside shell was left off to show the simplicity of the mechanism. Dr. Thwing said that every indication points to even a larger number of clay-plant installations than in 1915, which was their biggest year.

Although the Price Electric Company of Cleveland had no exhibit at the Convention, Salesmanager H. E. Covan was very much in evidence during the week. Their pyrometers have been installed in a large number of clay plants and they report a greater interest than ever from this industry. A. M. Price was also a visitor at "Brick and Clay Record's" reception room.

The Scandinavia Belting Company had one of the busiest rooms at the Statler, and they made a most favorable impression on the scores of callers. Their miniature edition of "Brick and Clay Record" showing the two front covers and some of the page advertisements they used in 1915, was the admiration of all, and the "Best Belt for the Brickman" was talked about everywhere. E. W. Kingsbury of the Cleveland office, J. W. Cushing of Chicago, and J. M. Hallisy of Columbus were ably assisted by J. H. Reside, J. K. Lutz and L. S. Scott.

Much interest was manifested in the Elevating Storage Battery Truck of the Elwell-Parker Electric Company of Cleveland. Their exhibit was at the Complete Building Show and C. B. Cook of that company had an opportunity to demonstrate to many clay plant managers and superintendents the great efficiency of this truck for internal plant hauling.

This was the first convention for Louis H. Wilkoff, of the Youngstown Steel Car Company of Youngstown, Ohio, but he made many new friends for himself and his product. The Youngstown steel clay car is used in several clay plants now with great success, and is making its way rapidly because of its unusual merit.

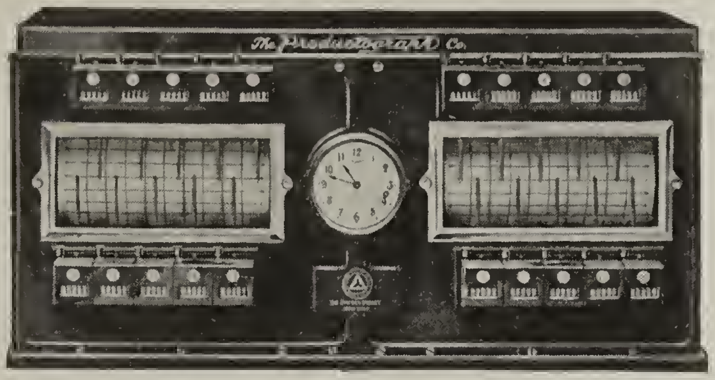
"Drying Clay Products in Sixty Minutes" was a slogan heard wherever men congregated, and Rooms 350 and 352 were filled constantly with clay products men, whose eager ears listened to the wonders of the Proctor Dryer made by Philadelphia Textile Machinery Company of Philadelphia. E. B. Ayres was assisted by R. O. Keiser and Harold Copping.

Thew Automatic Shovel Company had Room 431, and also a booth at the Complete Building Show, where D. D. Deeds, salesmanager, spent much of his time. The popularity of the Thew among clay men was amply demonstrated by the greetings they extended to Mr. Deeds.

W. Crow and J. C. Schaffer of the Schaffer Engineering & Equipment Company of Tiffin, Ohio, were kept busy telling about their poidometer, a clay measuring device which so many clay plants have installed.

"Nugget" Babbitt was on display in the Exhibitors' Room where the gold and silver samples told of the high character of this splendid product of The Cleveland Alloys Company. Bernard Bigsby, Jr., and E. J. Mellens represented the company.

H. P. Jenks of Vigo, Ohio, was a busy man in Room 325



This is the Machine

of which the Straitsville Impervious Brick Co. say:

"We have been operating the PRODUCTOGRAPH for a number of months now and it has been giving us very satisfactory service. It has taught us some things about our machine room which we did not know before--things that we should have known, but did not know, and which it has paid us well to find out. The PRODUCTOGRAPH, we find, is quite some little teacher, and for those who will care to follow, it will point the way constructively. We doubt if there is a brick plant in the country which could not learn something which it would be to its advantage to know from the use of a PRODUCTOGRAPH."

The PRODUCTOGRAPH gives you a mechanically accurate record of lost time, productive working time, average speed and output. This information will enable you to eliminate the faults that now retard production and reduce profits.

Literature and full information upon request.

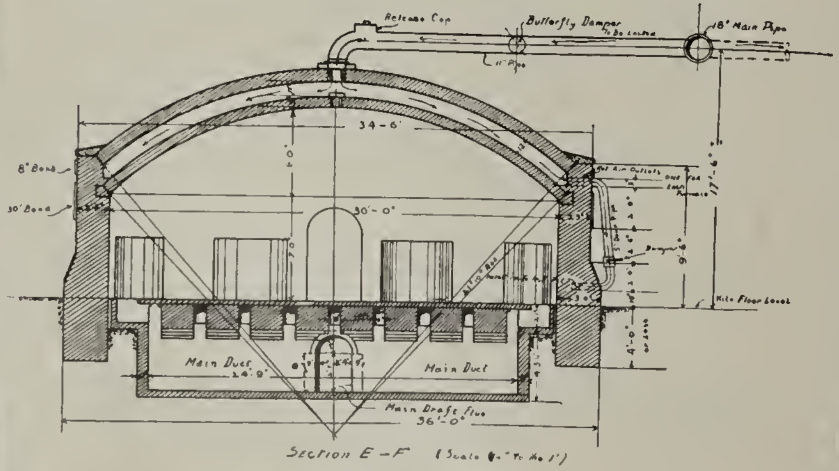
The Productograph Co.

30 CHURCH ST. SLOCUM-AVRAM-SLOCUM MANAGEMENT NEW YORK, N. Y.

McManigal's
Super Heating System for
DOWN DRAFT KILNS

In the above photograph is shown the system as actually installed on the paving brick plant of the Hocking Valley Brick Co. Paving block were burned in five and one-half days, saving two days in time and approximately 30 per cent of the former fuel consumption.

In the line drawing below is shown the construction. Air is introduced between the two crowns to absorb the immense amount of radiated heat, and is then conducted to the furnaces. Its economy and efficiency are proven facts. Ask us for the complete story.



Patented

The McManigal Grateless Furnace Co.
LOGAN, OHIO

It Can Be Built On Your Present Kilns

where he had an opportunity to tell a regular stream of callers why the Hook Patent Kiln Co.'s system has been adopted by sixty-five clay plants in the northwestern quarter of Ohio—to say nothing of the scores of installations in all other parts of the clay belt.

J. Otto Trautwein of the Trautwein Dryer and Engineering Company, Chicago, was kept busy telling of his latest installations of complete plants, driers and the Smith steel-encased kiln.

E. DeGroot of the Standard Dry Kiln Company, Indianapolis, kept everybody in a happy frame of mind by handing out the "Book of Smiles. Of course Standard driers were also much discussed with favor.

The Sanderson-Cyclone Drill Company, of Orrville, Ohio, was represented by W. T. Kershner who had no difficulty in locating interested clayworkers, who wanted to know more about the cyclone drill, now so generally used on clay plants where blasting is necessary.

Elmer E. Miller found many willing listeners when he talked about those famous Canton grates.

Coal for Ohio Clay Plants

Pittsburg No. 8 coal needs but very little introduction to the plants in the Ohio State district.

It is conceded to be one of the very best coals on the market for burning kilns, and this is further attested to by the numerous users.

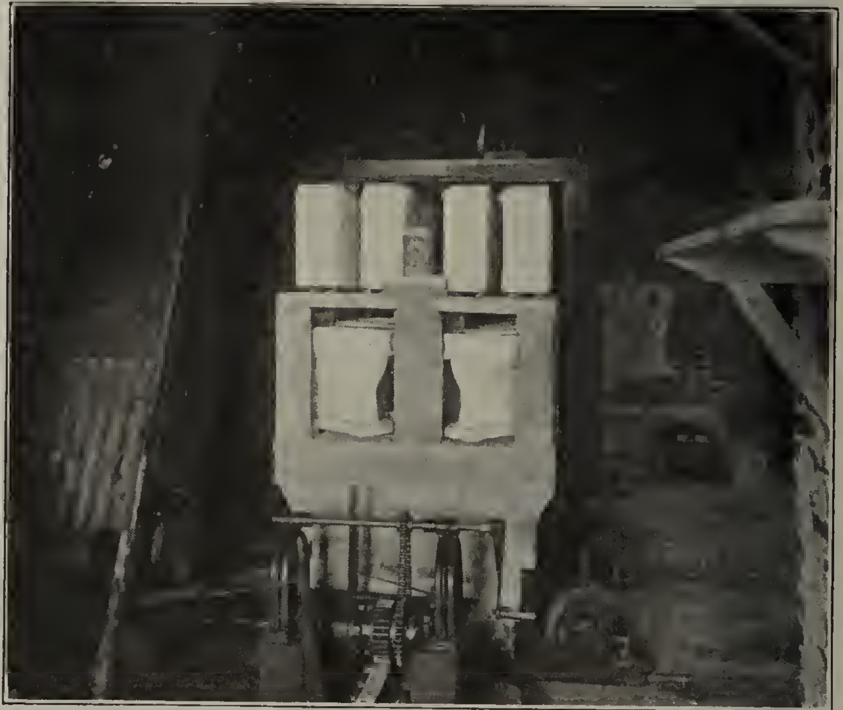
The Cleveland-Belmont Coal Company has located in the Republic Building, Cleveland, Ohio, has a mine located on this vien and is making a strong effort to increase the number of their customers who are using this coal.

Use that Cleveland address in making your inquiries.

Pottery Firing

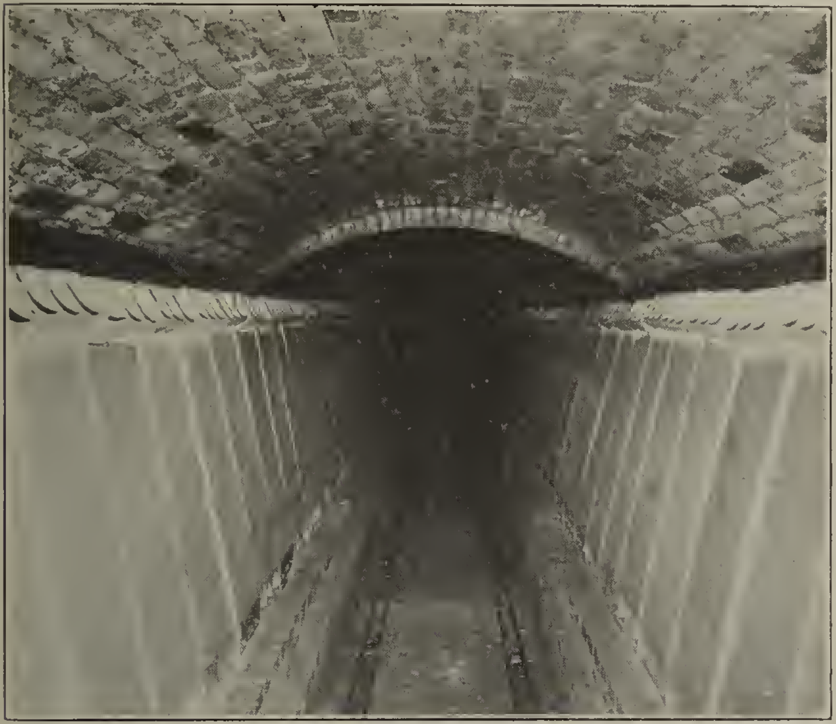
To the pottery manufacturer his firing is his nightmare. His money is expended on materials, labor, fuel, etc. The ware is put into the oven for burning, but what the result is going to be, he never knows.

One kind of ware has to be put in the outside ring, others in the middle, or tops. Naturally, it must happen that the particular ware required for a certain part of the oven is not always available; something unsuitable for that position is



Showing the Propelling Gear. Truck Loaded with Sanitary Ware About to Enter Tunnel Kiln. The Cones Are to be Seen on the Upper Shelf placed, with the result it may come out all right, but, more frequently than not, it comes out wrong.

The fuel varies; the winds vary, and, year in and year out for the past century, the fired product of the ceramic manufacturer has varied.



General View of Interior of Tunnel Kiln, Showing Hot Air Chambers

A few years ago, he (the manufacturer) would have told you that conditions over which he had no control rendered such results unavoidable.

In addition to the gamble as to results—fuel in the shape of smoke is seen issuing from the ovens, and he knows that it represents a certain amount of loss. The fact that the kilns are heated up with each firing, and cooled so that the ware can be drawn from the kilns has been looked upon as a necessary waste and evil. That the same has happened since the enameled brick were fired that went to build the Babylonian Temples two thousand years ago, has proved sufficient consolation.

For the thoughtful potter, these things, from now on, can be conditions of the past. The invention of Mr. Dressler has so revolutionized the process of firing, that it is no longer one of chance, but a controllable one in every way. The way the wind blows, or the quality of the fuel, does not enter into the proposition. The necessary draft is regulated by a fan, worked automatically; the coal is changed into so many B. T. U's, and the quantity required is measured. It is not as the Staffordshire workman would say "Shuv anuther batin on and then it's finished."

The Dressler Tunnel Kiln economizes in a degree never deemed possible. In fuel, it will save, as compared with the ordinary round intermittent kiln, from 70 per cent to 80 per cent.

The labor difficulty of being able to secure skilled, experienced and sober men is entirely eliminated. No skilled labor is required. The perfect control of the process permits of the firing being uniform; consequently, the losses usually entailed through bad or uneven firing are avoided.

In the advertisement of the American Dressler Tunnel Kiln in our issue of February 15, an error was made in reference to the saving effected by the use of this kiln over present methods. It should have read: "It effects a saving of 80 per cent of the fuel cost, 33⅓ per cent of the labor cost, and 60 per cent of the sogger cost."

What the Dressler Tunnel Kiln can do for every Manufac-

GANDY

One Word—GANDY and What It Means

THIRTY-EIGHT years ago there was just one kind of stitched cotton duck belting made in this country.

That was GANDY.

Then, and in following years, Gandy proved to be such a success that other concerns imitated it. They made cotton duck belting, too.

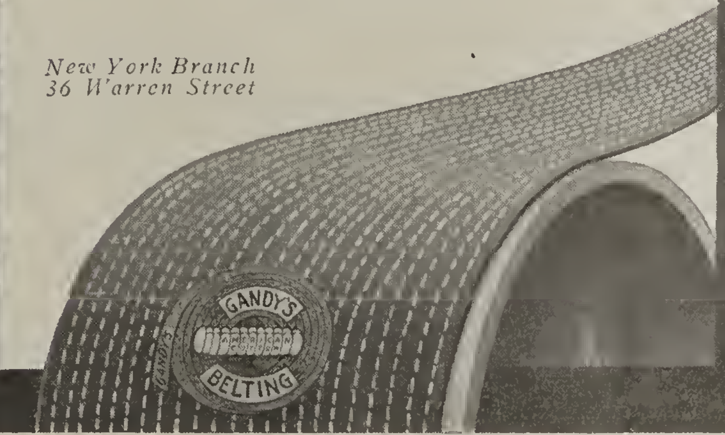
But GANDY was—and is now—so dominant in the whole belting industry that the name "Gandy" came to be used to designate *any* make of cotton duck belting.

For this reason, belt users who realize that Gandy pre-eminence is due solely to its superior value should take extra precaution not only to write the word "Gandy" into each belting order, but to examine the belting sent them to see that it has the Gandy trademark stamped on it.

Write for sample and prices. There is no obligation.

The Gandy Belting Company
732 W. Pratt Street
Baltimore, Md.

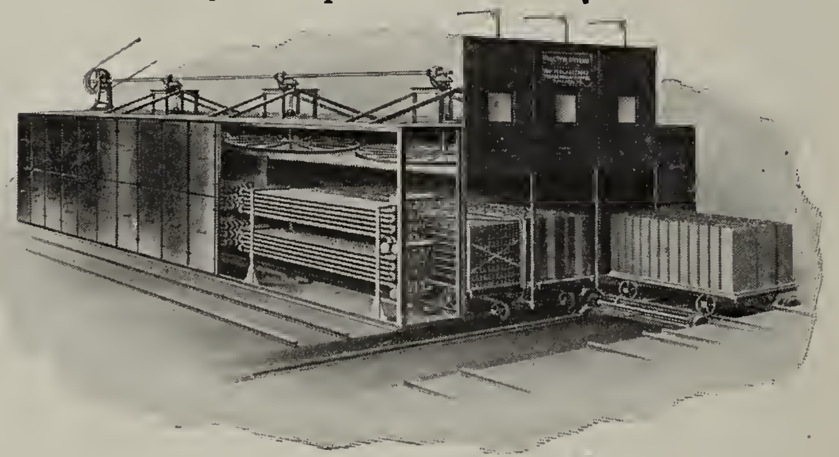
New York Branch
36 Warren Street



It will balance your plant; it will safely, speedily and thoroughly dry your ware.

T IS A PROCTOR DRYER

It stands head and shoulders above all previous efforts and plans. Technically and scientifically, it follows advanced thought and theory; practically, it sustains theory and is an actual proven success on modern plants.



Speed, safety and thoroughness are the necessary requisites of the successful dryer.

These the Proctor dryer has to a simply wonderful degree, which means exceptional economy.

The Philadelphia Textile Machinery Co.
Hancock and Somerset Streets PHILADELPHIA, PA

We have a booklet, "Drying Clay Products in Sixty Minutes"
Ask for it

turer of clay products should be their first consideration. The American Dressler Tunnel Kilns, Inc., 171 Madison Ave., New York City, can tell you all about it.

Baldwin's Gasoline Locomotive

This locomotive is built in the best possible manner. It is constructed of the very best material, and it upholds in every particular the Baldwin reputation.

The plants that are using it find a "Buy Well" satisfaction in a locomotive that has proven that it is always ready to pull hard.

Ask the Baldwin Locomotive Works, of Philadelphia, Pa., for Record No. 74. It gives data and information that are alike valuable and interesting.

Newaygo Separators

Accompanying this is a reproduction of a page from a catalog descriptive of Newaygo screens, for use in screening clay and other materials.

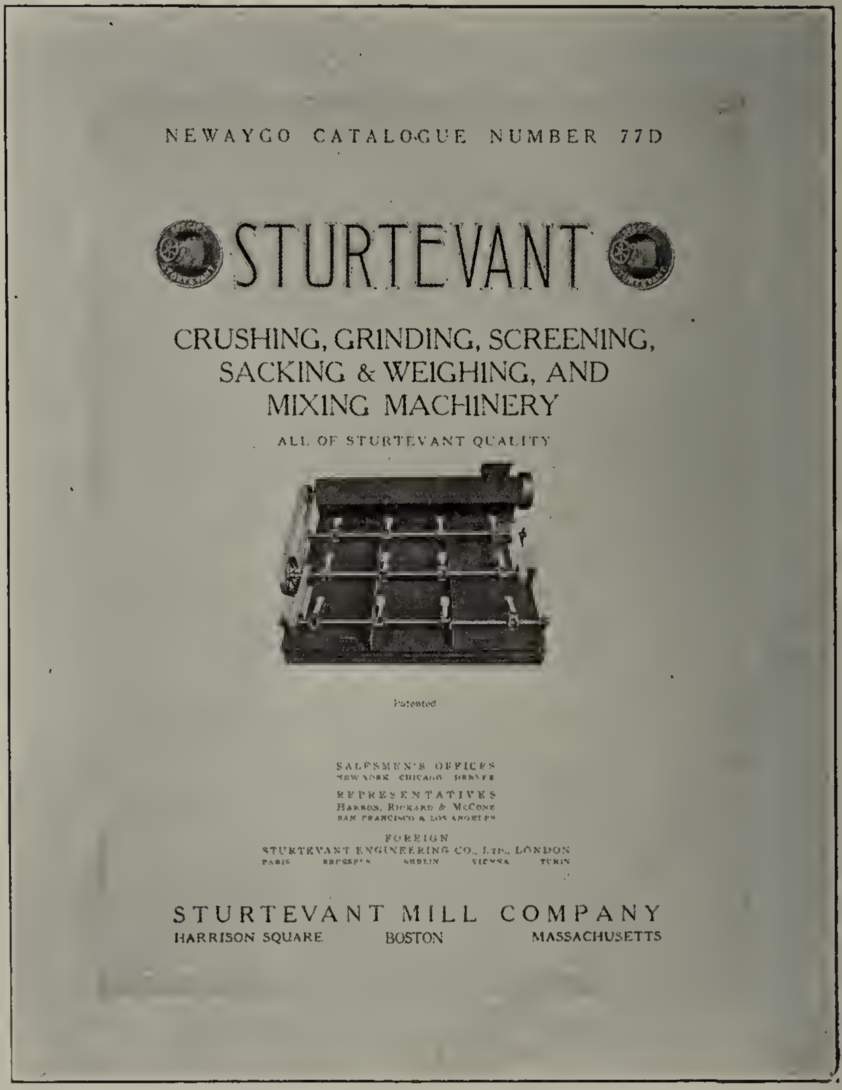
The Newaygo Separator is a patented, inclined, vibrating screen or series of screens enclosed in a practically dust-proof steel case.

Any mesh screen can be obtained, from one half inch to 180 mesh (32,400 holes per square inch) and the fact that it is dust proof makes a big impression with the new cult of "Buying Well."

It is widely used on all classes of clay plants now and is destined to see a still more extensive use. The Sturtevant Mill Company, Boston, Mass., can tell you more about it.

The Productograph

The clay products industry is today duplicating the strides taken by the electrical and mechanical industries of a decade ago.



NEWAYGO CATALOGUE NUMBER 77D

STURTEVANT

CRUSHING, GRINDING, SCREENING,
SACKING & WEIGHING, AND
MIXING MACHINERY

ALL OF STURTEVANT QUALITY

Patented

SALESMEN'S OFFICES
NEW YORK CHICAGO DENVER

REPRESENTATIVES
Harron, Rickard & McCone
SAN FRANCISCO & LOS ANGELES

FOREIGN
STURTEVANT ENGINEERING CO., Ltd., LONDON
PARIS BRUSSELS BERLIN VIENNA TURIN

STURTEVANT MILL COMPANY
HARRISON SQUARE BOSTON MASSACHUSETTS

A Page from the Sturtevant Catalog

The marvelous advance made has been a matter of wide comment, for the industry as a whole has been eager to grasp and absorb all devices and equipment that would have a tendency towards lowered costs.

The Productograph is such an instrument. It is to the plant manager what the pyrometer is to the burner. It gives you a mechanically accurate record of lost time, productive working time, average speed and output.

Book Telling About Crescent Belt Fasteners.

The information that it constantly furnishes to you in your office, concerning all that is taking place in the plant, gives to you a method leading toward perfect control of operations.

Faults that retard production, which in turn decrease output, are indicated or pointed out by this method of keeping close check on manufacturing operations.

John D. Martin, of the Straitsville Impervious Brick Company, of New Straitsville, Ohio, says that he would not be without it.

Literature can be obtained from the Productograph Company, 30 Church St., New York City.

The Crescent Catalog

This pamphlet offers specialized information not only on Crescent belt fasteners, but also by descriptive reading matter and cuts, it gives information of a more general nature, calculated to instruct the man who actually has the responsibility of keeping the power transmission equipment delivering power.

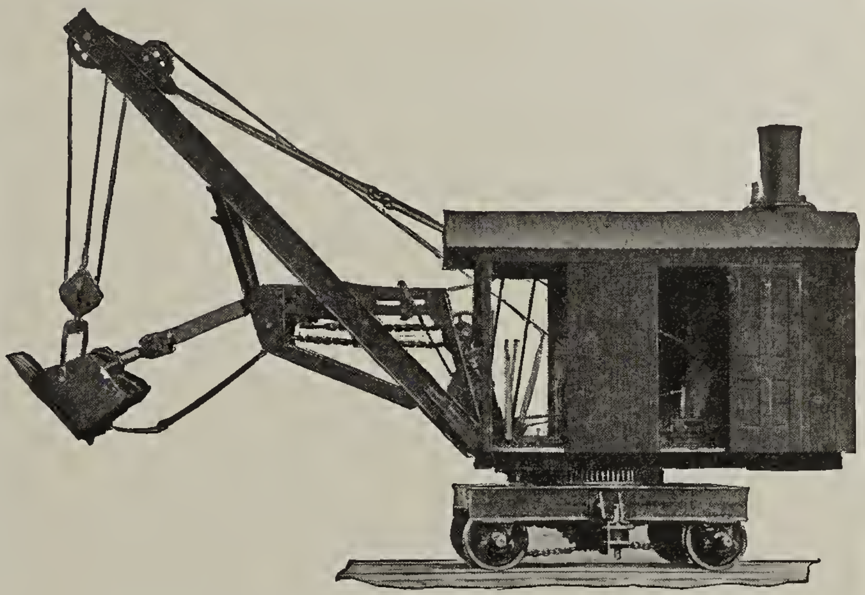
This catalog may be obtained by addressing the office of The Crescent Belt Fastener Company, 381 Fourth Avenue, New York City.

Metallic Radiation Heat Driers

Thos. M. Wilson has formed a new company to take care of his increasing business in both driers and kilns.

The new company is named the Brick and Clay Engineering Company, and is located at 5116 Walnut St., Philadelphia, Pa. The Thos. M. Wilson Company has been engaged in constructing radiation driers and various types of kilns since 1900, and is today completely euipped to give satisfaction in this very important department of all clayworking plants.

A Thew Shovel will last 24 years



The first Thew Shovel did not look as good as this. It was not as good as this shovel. It will not last as long as the new Thews, yet the first Thew Shovel has been in continuous service 24 years.

This is what the owner says about it: "No better shovel was ever put up. It is not very handsome to look at, but is very economical in operation and does its work without any trouble. We can't say anything too good about the shovel."

The real test of any machine is the test of years. Hourly, daily or even monthly outputs are of secondary interest. The important question is what will the machine do year after year? The above statement shows that The Thew is equal to the supreme test.

The definite policy of building the best possible shovel regardless of cost of production and an honest endeavor to render the best possible service to every Thew owner makes it possible for the Thew Automatic Shovel Company to refer to any Thew owner anywhere.

Use a Thew—It pays—Join the Thew Boosters Club. There are over 300 Brick manufacturers who are loyal Thew Boosters. Write for the names of those near you.

Circular 22-C gives actual costs of handling clay.

The Thew Automatic
Shovel Co.
Lorain, Ohio

THE BEIGHLEE

"A Pyrometer with a conscience"

Why?

Because it is made—a compensating instrument—a new, timely, 1916 model involving improvements found only in The Beighlee.

It reads the same in cold as in hot weather; it is automatically compensated.

The very bigness of the Beighlee insures accurate readings. The big, broad dial reduces the chance for error.

Its bigness insures a staunch, steady and an exceptionally accurate instrument.

Beighlee's—are impressive and it is only a natural sequence that our exhibit at the conventions should cause the keen investigations.

The absolutely new features of control, the safety devices, the compensating devices, the broad dial—all found only in Beighlee's—indicate advanced thought—and are the reasons why for "a pyrometer with a conscience."

Ask for detailed information now.

Beighlee Electric Co.
Cleveland, Ohio

Gibb Instrument Co., Highland Bldg., Pittsburgh, Pa., Representative in Pennsylvania and Virginia.

Herman A. Holz, Hudson Terminal Bldg., N. Y. City Representative in New England States.

Three to twelve individual, twenty-four hour records on the one chart.

The Osgood Company Increases Its Capacity

In order to take care of its rapidly increasing business, the Osgood Company, of Marion, Ohio, manufacturers of steam shovels and dredges, has found it necessary to double its capacity and has purchased the manufacturing plant of the Ohio Tractor Company.

The larger machine tools, for which crane service is desirable, will be moved to the main plant of the Osgood Company, while the smaller tools and the foundry will be operated at their present location. The Ohio Tractor Company has acquired a new site in the south part of Marion, and is making arrangements to increase its output.

Changes Name to The Barrett Company

It is announced that the American Coal Products Company and the Barrett Manufacturing Company have decided to unite the good-will and high reputation of both concerns under the name of The Barrett Company.

The American Coal Products Company is well known in connection with the sale of sulphate of ammonia, and heretofore owned the stock of the Barrett Company.

The fact that all the coal tar chemicals, disinfectants, roofing, waterproofing, road-making and wood preserving materials have been made and widely advertised in the name of the Barrett Manufacturing Company has added immensely to the good-will attached to the Barrett name.

The new company will have the same amount of stocks as the American Coal Products Company and the change in name will be accomplished by exchanging the outstanding certificates share for share.

Some of the widely advertised trade-marks of the Barrett Manufacturing Company will be recognized in Barrett Specification Roofing, Tarvia, for roads, and Congoleum floor coverings—the latter being manufactured and distributed by The Congoleum Company department of The Barrett Company.

The products of the Chemical Department of The Barrett Company are receiving particular attention at this time, due to the European situation, and it is expected that this branch of the business will be of larger importance hereafter, as the advantage of an American source of supply will doubtless appeal to users of these products.

The Barrett Company in this Department has produced for many years pure (natural) carbolic acid, cresylic acid, refined naphthaline (in various forms), benzol, toluol, etc., in addition to which they also now manufacture considerable quantities of synthetic carbolic acid (phenol).

Frederick C. Bogk of Ricketson mineral paint fame, is one of the aldermen-at-large at Milwaukee, Wis., who has not taken out papers for his renomination. As a result, citizens of Milwaukee have started a movement which will have for its purpose, as explained by Attorney William Kaumheimer, "the task of insisting on a faithful servant being re-elected to the aldermanic body without the expense of conducting a campaign. As chairman of the finance committee of the common council Mr. Bogk has been steadfastly attempting to keep down appropriations without harassing the work of the department. He has been active in the salary revision work and that work is to be completed during the coming fall. Standing always for efficiency and economy in public affairs, he has been progressive and active in promoting movements looking for welfare of the people. He has behind him experience which makes his service invaluable to the municipality. It is hoped a sufficient number of men will interest themselves to induce Mr. Bogk to continue his service."

THE BUYERS' DIRECTORY
Of Clay Products Machinery Manufacturers

Analysts and Chemists, Clay.
Ceramic Sup. & Cons. Co.
Aerial Tramways.
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Babbitt Metal.
Cleveland Alloys Co.
Fate Co., J. D.
Gerlock, H. W.
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American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
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Chambers Bros. Co.
Chase Fdry. & Mfg. Co.
Fate Co., J. D.
Freese & Co., E. M.
Gerlock, H. W.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Pettigrew Fdry. Co.
Steele & Sons, J. C.
Stevenson Company.
Toronto Fdry. & Machine Co.
Wallace Mfg. Co.
Weller Mfg. Co.
Barytes, Carbonate of.
Roessler Hasslacher Chem. Co.
Belts.
American Clay Machy. Co.
Bonnot Co.
Ceramic Sup. & Cons. Co.
Freese & Co., E. M.
Gandy Belting Co.
Main Belting Co.
Manufacturers Equipment Co.
Sawyer Belting Co.
Belt Conveyors.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Ceramic Sup. & Cons. Co.
Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Gandy Belting Co.
Link-Belt Co.
Main Belting Co.
Manufacturers Equipment Co.
Weller Mfg. Co.
Belt Dressing.
Cling-Surface Co.
Belt Fasteners.
Crescent Belt Fastener Co.
Flexible Steel Lacing Co.
Boilers.
(See Engines and Boilers.)
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Brick Conveyors.
Bonnot Co.
Brewer & Co., H.
Ceramic Sup. & Cons. Co.
Chambers Bros. Co.
Fate Co., J. D.
Link-Belt Co.
Manufacturers Equipment Co.
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Broderick & Bascom Rope Co.
Cars.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Chase Fdry. & Mfg. Co.
Fate Co., J. D.
Freese & Co., E. M.
Gerlock, H. W.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Pettigrew Foundry Co.
Standard Dry Kiln Co.
Toronto Fdry. & Machine Co.
Trautwein Dryer & Eng. Co.
Weller Mfg. Co.
Youngstown Steel Car Co.
Car Movers.
Marion Mach., Fdry. & S. Co.
Cartons.
Hinde & Dauch Paper Co.
Castings.
American Clay Machy. Co.
Bonnot Co.
Chambers Bros. Co.
Gerlock, H. W.
Link-Belt Co.
Manufacturers Equipment Co.
Toronto Fdry. & Machine Co.
Cement Filler.
Lehigh Portland Cement Co.
Chains (Steam Shovel).
Woodhouse Chain Works.
Clay Feeders and Mixers.
American Clay Machy. Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Louisville Machine Co.
Manufacturers Equipment Co.
Marion Mach., Fdy. Sup. Co.
Schaffer Eng. & Equipment Co.
Steele & Sons, J. C.
Stevenson Company.
Toronto Fdry. & Machine Co.
Clay Gatherers.
Sauerman Bros.
Schofield-Burkett Cons. Co.
Clay Steamers.
American Clay Machy. Co.
Schaffer Eng. & Equipment Co.
Clutches.
Hill Clutch Co.
Coal.
Cleveland-Belmont Coal Co.
Chicago, Wilmington & Franklin Coal Co.
Old Ben Coal Co.
Coloring.
Ricketson Mineral Paint Wks.
Williams & Co., C. K.
Conveying Machinery.
(See Elevators and Conveyors.)
Counters.
Ceramic Supply & Cons. Co.
Crushers and Pulverizers.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Manufacturers Equipment Co.
Wallace Mfg. Co.
Cutters, Automatic Rotary.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Chambers Bros. Co.
Crawford & McCrimmon.
Fate Co., J. D.
Manufacturers' Equipment Co.
Freese & Co., E. M.
Marion Machine, Fdry. & Supply Co.
Steele & Sons, J. C.
Wallace Mfg. Co.
Cutting Wires.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Fate, J. D. Co.
Freese & Co., E. M.
Manufacturers Equipment Co.
Webb Wire Works.
Dies.
American Clay Machy. Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Fate, J. D. Co.
Freese & Co., E. M.
Louisville Machine Co.
Manufacturers Equipment Co.
Nuttall Co., R. D.
Weller Mfg. Co.
Disintegrators.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery
Fate Co., J. D.
Freese & Co., E. M.
Manufacturers Equip. Co.
Marion M., Fdry. & Sup. Co.
Door Carrier (Dry Kiln).
Dry Kiln Door Carrier Co.
Drills.
Sanderson-Cyclone Drill Co.
Dryers.
American Clay Machy. Co.
American Process Co.
Bartlett Snow & Co., C. O.
Bonnot Co.

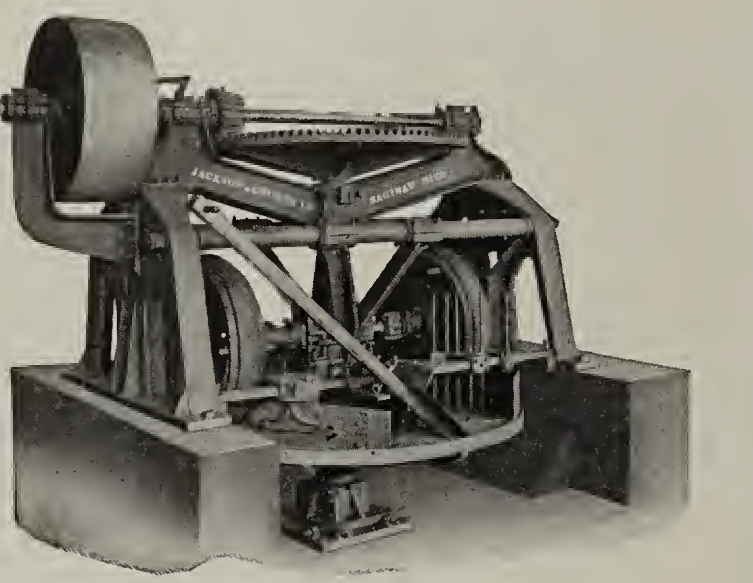
Practically all Coal Miner's Wage Agreements Expire April 1.

Your future supply of coal depends on the outcome of negotiations, which will begin at Mobile, Ala., February seventh.

For first-hand information concerning this Wage Controversy and its bearing upon your business, become a regular reader of THE BLACK DIAMOND as so many clay product manufacturers already are. Each week's issue contains a vast amount of news of vital interest and importance to you.

Costs but $3.00 a year, 52 issues

THE BLACK DIAMOND
"The coal trade's leading journal"
CHICAGO
New York Cincinnati Pittsburgh



Grinding Pan

Wet or Dry

Especially rugged and substantial. Nine-foot size weighs 40,000 lbs. Large shafts with bearings close to point of labor. Accessible adjustable step box. Extra heavy mullers and wear plates of hard white iron. All parts interchangeable. Repair parts always in stock and low in price.

Jackson & Church Co.

Saginaw, Mich.

Builders of a complete line of machinery for making Sand-Lime Brick. Boilers, Rotary Dryers and Kilns, etc.

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- Boss Co., J. C.
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- Manufacturers Equipment Co.
- Smith Co., Claude.
- Philadelphia Textile Mchy. Co.
- Standard Dry Kiln Co.
- Steele & Sons, J. C.
- Trautwein Dryer & Eng. Co.
- Wilson, Thos. M.

Dryers (Sand).

- American Process Company.
- Ceramic Supply & Cons. Co.
- Fate Co., J. D.
- Jackson & Church Co.
- Schaffer Eng. & Equip. Co.

Dry Pans.

- American Clay Machy. Co.
- Bonnot Co.
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- Fate Co., J. D.
- Freese & Co., E. M.
- Jackson & Church Co.
- Manufacturers Equipment Co.
- Stevenson Company.
- Toronto Fdry. & Mach. Co.

Dry Press Brick Machines.

- American Clay Machy. Co.
- Bonnot Co.
- Ceramic Supply & Cons. Co.

Dynamos.

- General Electric Co.
- Westinghouse El. & Mfg. Co.

Electric Shovels.

- American Clay Machy. Co.
- Link-Belt Co.
- Marion Steam Shovel Co.
- Thew Automatic Shovel Co.

Electrical Instruments.

- Brown Instrument Co.
- Engelhard, Chas.
- General Electric Co.
- Taylor Instrument Companies.

Elevators and Conveyors.

- American Clay Machy. Co.
- Bonnot Co.
- Ceramic Supply & Cons. Co.
- Chambers Bros. Co.
- Clearfield Machine Shops.
- Fate, J. D. Co.
- Freese & Co., E. M.
- Gandy Belting Co.
- Link-Belt Co.
- Louisville Machine Co.
- Main Belting Co.
- Manufacturers Equipment Co.
- Toronto Fdry. & Machine Co.
- Weller Mfg. Co.

Engines and Boilers.

- American Clay Machy. Co.
- Bonnot Co.
- Freese & Co., E. M.
- Jackson & Church Co.
- Manufacturers Equipment Co.
- Murray Iron Wks. Co.

Excavators.

- Sauerman Bros.
- Schofield-Burkett Cons. Co.

Engineers and Builders.

- American Clay Machy. Co.
- Broderick & Bascom Rope Co.
- Ceramic Supply & Cons. Co.
- Chambers Bros. Co.
- Freese & Co., E. M.
- Smith Co., Claude.
- Trautwein Dryer & Eng. Co.

Explosives.

- Du Pont Powder Co.

Fans.

- American Blower.
- American Clay Machy. Co.
- Bonnot Co.
- Freese & Co., E. M.
- Manufacturers Equipment Co.
- Murray Iron Works Co.
- Trautwein Dryer & Eng. Co.

Feed Water Heaters.

- Canton Grate Co.
- Freese & Co., E. M.
- Jackson & Church Co.
- Murray Iron Wks. Co.

Filler (Paving).

- Barret Mfg. Co.
- Lehigh Portland Cement Co.

Filter Presses.

- American Clay Machy. Co.
- Baird Machine & Mfg. Co.
- Bonnot Co.
- Stevenson Company.

Flower Pot Machinery.

- Baird Machine & Mfg. Co.

Flue Cleaners.

- Marion Mach. Fy. & Sup. Co.

Frogs and Switches.

- Atlas Car & Mfg. Co.
- Buckeye Rolling Mill Co.
- Cincinnati Frog & Switch Co.
- Toronto Fdry. & Machine Co.

Gears.

- American Clay Machy. Co.
- Baird Machine & Mfg. Co.
- Fate, J. D. Co.
- Chambers Bros. Co.
- General Electric Co.
- Link-Belt Co.
- Nuttall Co., R. D.
- Toronto Fdry. & Machine Co.

Granulators.

- American Clay Machy. Co.
- Bonnot Co.
- Brewer & Co., H.
- Chambers Bros. Co.
- Fate Co., J. D.
- Freese & Co., E. M.
- Steele & Sons, J. C.
- Wallace Mfg. Co.

Grates and Grate Bars.

- Armstrong Mfg. Co.
- Brewer & Co., H.
- Canton Grate Co.
- Chambers Bros. Co.
- Cyclone Grate-Bar Co.
- Fate Co., J. D.
- Gerlock, H. W.
- Jackson & Church Co.
- Manufacturers Equipment Co.
- Marion Mach., Fdry. & S. Co.
- Martin Grate Co.
- Murray Iron Wks. Co.
- Smith Co., Claude.
- Toronto Fdry. & Machine Co.

Grease.

- Stock Xylite Grease & Oil Co., G. B.

Hand Power Presses.

- Fate Co., J. D.

Hoists.

- American Clay Machy. Co.
- Bonnot Co.
- Chambers Bros. Co.
- Fate Co., J. D.
- Link-Belt Co.
- Manufacturers Equipment Co.
- Weller Mfg. Co.

Hollow Brick Machinery.

- American Clay Machy. Co.
- Bonnot Co.
- Chambers Bros. Co.
- Fate Co., J. D.
- Freese & Co., E. M.
- Manufacturers Equipment Co.

Hygrometers or Moisture Indicators.

- Taylor Instrument Companies.

Kilns.

- American Clay Machy. Co.
- Bonnot Co.
- Boss Co., J. C.
- Chambers Bros. Co.
- Didier-March Co.
- Fate Co., J. D.
- Hook Patent Kiln Co.
- Manufacturers Equipment Co.
- McManigal Grateless Furnace Co.
- Ohio Kiln Co.
- Schaffer Eng. & Equip. Co.
- Smith Co., Claude.
- Tecktonius Mfg. Co., E. C.
- Wilson, Thos. M.

Kiln Accessories.

- Caldwell Co., W. E.
- Fate Co., J. D.
- Gerlock, H. W.
- Lakewood Engineering Co.
- Manufacturers Equipment Co.
- Smith Co., Claude.
- Tecktonius Mfg. Co., E. C.

Lime Mixers.

- Gerlock, H. W.

Locomotives (Electric).

- General Electric Co.

Locomotives (Gasoline).

- Baldwin Locomotive Works.
- Fate Co., J. D.

Locomotives (Steam).

- Dewey Bros., Inc.

Lubricants.

- Stock Xylite Grease & Oil Co., G. B.

World's Highest Quality of Clay Working Machinery

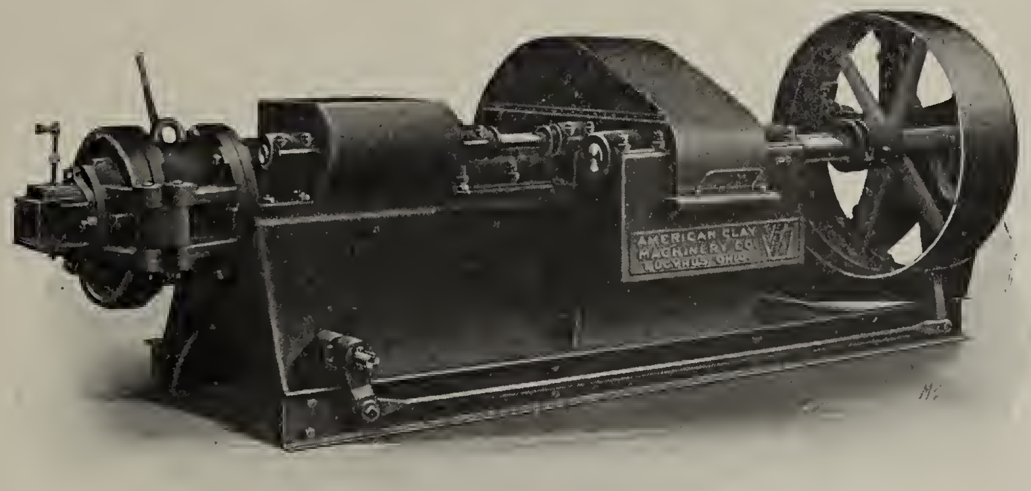
$300,000 Was Unanimously Voted for Six Miles of Brick Streets on Feb. 15, by Bucyrus, Ohio.—That's our town.

THE above announcement, handsomely painted on a sixteen-foot banner, was sent to the National Paving Brick Manufacturers' Convention at Cleveland with the compliments of the Bucyrus Industrial Association. The election was promoted and fostered by the Bucyrus commercial body and indicates the loyalty of Bucyrus business men to the American Clay Machinery Co. and to Brick streets. Bucyrus has had brick streets for thirty-four years. Bucyrus has had the American company for over fifty years and at the recent election she overwhelmingly reaffirmed her confidence in both.

Whether you are so located as to be able to get a part of this big order for brick or not, you are benefitted. There is another way that Bucyrus can benefit you and a way you can benefit Bucyrus and that is by the installation of some of our new line of Brick Making Machinery.

Our new Auger machines, Pug Mills, Represses, Cutters, Pans and other machines will increase your output, lessen the cost of production, save on up-keep expense and will improve your quality. Then by adding the Haigh Continuous Kiln you will have an equipment which will produce your output at the minimum of cost.

Here is the No. 290 Auger machine. We sold two of these at the convention as well as a lot of other machinery. Let us send you the specifications on this machine and any others in which you may be interested. The specifications will tell the story of Quality.



The American Clay Machinery Co., - Bucyrus, Ohio, U.S.A.

Get a copy of the March American Clay Magazine. Free for Asking.

SAY "I SAW IT IN BRICK AND CLAY RECORD"

THE BUYERS' DIRECTORY—Continued

Manganese.
Roessler & Hasslacher Chemical Co.

Mortar Colors.
Ricketson Mineral Paint Wks.
Williams & Co., C. K.

Molds.
American Clay Machy. Co.
Baird Machine & Mfg. Co.
Bonnot Co.
Gerlock, H. W.
Manufacturers Equipment Co.

Mold Sanders.
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Bonnot Co.
Manufacturers Equipment Co.

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General Electric Co.
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Kelly-Springfield Motor Truck Co.

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Schurs Oil Burner Co.
Weller Mfg. Co.

Oil Filters.
Canton Grate Co.

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Ricketson Mineral Paint Wks.
Williams & Co., C. K.

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Bonnot Co.
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Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Jackson & Church.
Manufacturers Equipment Co.

Pallets and Trays.
Lakewood Engineering Co.
Ohio Galvanizing & Mfg. Co.

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Brewer & Co., H.
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Hendrick Mfg. Co.

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Schaffer Eng. & Equip. Co.

Portable Track.
Atlas Car & Mfg. Co.
Cincinnati Frog & Switch Co.
Lakewod Eng. Co.
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Standard Dry Kiln Co.

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Bonnot Co.
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Toronto Fdry. & Machine Co.

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Jackson & Church Co.
Link-Belt Co.
Murray Iron Wks. Co.
Trautwein Dryer & Eng. Co.
Weller Mfg. Co.

Power Transmission.
Baird Machine & Mfg. Co.
Link-Belt Co.

Productograph.
Productograph Company.

Proportioner.
Schaffer Eng. & Equip. Co.

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Bonnot Co.
Brewer & Co., H.
Chambers Bros. Co.
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Fate Co., J. D.
Freese & Co., E. M.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Stevenson Company.
Wallace Mfg. Co.

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(See Crushers.)

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Bristol Co.
Brown Instrument Co.
Ceramic Supply & Cons. Co.
Engelhard, Chas.
Price Electric Co.
Stupakoff Laboratories.
Taylor Instrument Companies.
Thwing Instrument Co.
Trautwein Dryer & Eng. Co.

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Ceramic Supply & Cons. Co.
Chase Fdry. & Mfg. Co.
Cincinnati Frog & Switch Co.
Lakewood Engineering Co.
Toronto Fdry. & Machine Co.

Rattler.
American Clay Machy. Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Freese & Co., E. M.
Manufacturers Equipment Co.

Recording Gages.
Brown Instrument Co.
Ceramic Supply & Cons. Co.
Price Electric Co.
Taylor Instrument Companies.

Represses.
American Clay Machy. Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Freese & Co., E. M.
Lakewood Engineering Co.
Steele & Sons, J. C.

Revolution Indicators.
Brown Instrument Co.
Ceramic Supply & Cons. Co.

Rope Preservative.
Cling-Surface Co.

Roofing Tile Machinery.
American Clay Machy. Co.
Bonnot Co.
Fate Co., J. D.
Freese & Co., E. M.
Manufacturers Equipment Co.

Rope (Wire and Manila).
Broderick & Bascom Rope Co.
Manufacturers Equipment Co.

Sand Dryers.
American Clay Machy. Co.
American Process Co.
Bonnot Co.
Fate Co., J. D.
Jackson & Church Co.
Schaffer Eng. & Equip. Co.

Sand Lime Brick Machinery.
American Clay Machy. Co.
Ceramic Supply & Cons. Co.
Chicago Brick Machy. Co.
Jackson & Church Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.

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Schofield-Burkett Cons. Co.

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Bonnot Co.
Brewer & Co., H.
Chase Fdry. & Mfg. Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Hendrick Mfg. Co.
Lakewood Engineering Co.
Link-Belt Co.
Louisville Machine Co.
Schofield-Burkett Cons. Co.
Stevenson Company.
Sturtevant Mill Co.
Weller Mfg. Co.

Sewer Pipe Machinery.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Manufacturers Equipment Co.
Stevenson Company.

Silent Chain Drives.
Link-Belt Co.

Silo.
Kalamazoo Tank & Silo Co.

Soft Mud Brick Machines.
American Clay Machy. Co.
Bartlett & Snow Co., C. O.
Bonnot Co.
Chambers Bros. Co.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Wallace Mfg. Co.

THE BUYERS' DIRECTORY—Continued

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American Clay Machy. Co.
Schaffer Eng. & Equip. Co.

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Canton Grate Co.

Steam Shovels.
American Clay Machy. Co.
Marion Steam Shovel Co.
Osgood Company.
Thew Auto. Shovel Co.

Stiff Mud Brick Machines.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
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Fate Co., J. D.
Freese & Co., E. M.
Steele & Sons, J. C.
Stevenson Company.
Wallace Mfg. Co.
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Lakewood Eng. Co.
Ohio Galvanizing & Mfg. Co.

Ties (Steel) and Tie Plates.
Cincinnati Frog & Switch Co.

Steel Towers.
Caldwell Co., W. E.

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Bonnot Co.
Brazil Machine & Fdy. Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
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Lakewood Engineering Co.
Manufacturers Equipment Co.
Steele & Sons, J. C.
Stevenson Company.
Wallace Mfg. Co.
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Kalamazoo Tank & Silo Co.

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Ceramic Supply & Cons. Co.
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Price Electric Co.
Manufacturers Equipment Co.
Standard Dry Kiln Co.

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Bonnot Co.
Brewer & Co., H.
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Fate Co., J. D.
Freese & Co., E. M.
Manufacturers Equipment Co.
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No Mystery

about brick drying. No "secret processes." The three drying agents—heat, humidity and circulation of air—must be capable of being separately controlled, in order to secure the correct drying conditions for the particular variety of clay you have to dry.

That's all. Get **perfect control** and you get satisfactory results. That's why so many brick manufacturers have installed

The Standard Drier

—the drier in which **all** the drying elements are **always** under control. Write for the catalog. Address: The Standard Dry Kiln Co., 1540 McCarty St., Indianapolis, Ind.

The Cleveland Conventions Were Profitable to Those Who Went for Profit

The Wise Man of FATE

When one **wants** to profit by coming in contact with fellow co-laborers he usually succeeds.

Conventions, therefore, can be made profitable or unprofitable, just as one determines.

The same is true in all business effort and initiative, and especially true with clay workers who **want** to profit by the successes of other clay workers.

Many of the most successful clay workers attribute their success to

The FATE

Premier Line

of Clayworking Machines and Devices

Look over the list of some of the largest plants in the United States and Canada and you will find Fate Premier machinery converting raw clay into finished product at the minimum of cost and the maximum of production and perfection.

This line of clayworking machinery has been standard for nearly half a century and its long record of achievement, even under the most severe tests, proves that there is **something** about it worth investigating.

Why Not Profit Yourself by the Experience of Other Clayworkers?

The other man's success always is worth investigating. If you care to know **why** and **how** some of these large (and small plants, too) make a success out of their business, we will lay the facts before you.

"Fate's Free Service Men" is an organization of practical men which is at your disposal on any problem that confronts you. Put any question up to them and the information is yours without price.

USE COUPON For your convenience there is a coupon at the right. Check off in the little squares the item you are most interested in, or if you prefer, write us a personal letter with any details you deem necessary to give us a thorough understanding.

The J. D. Fate Co., 240 Riggs Avenue, Plymouth, O. We are interested in the following items and wish you to show us how your Full-Measure Service will benefit us—this request not obligating us in any manner.

☐ Auger Brick Machinery.
☐ Hollow Ware Machinery.
☐ Conveyors.
☐ Crushers.
☐ Elevators.
☐ Clay Feeders.
☐ Disintegrators.
☐ Pug Mills.
☐ Clay Testing.
☐ Full Equipment.
☐ Industrial Locomotives.
☐ Drain Tile Machinery.

Name..

Town.............................. State..........

The J. D. Fate Company

240 Riggs Avenue PLYMOUTH, OHIO

SAY I SAW IT IN BRICK AND CLAY RECORD

KELLY TRUCKS

Kelly Adjectives are Kelly Facts

What we tell you about Kelly Trucks is **built into them.** Advertising hasn't "made" Kelly Trucks—Kelly Trucks are what make our advertising.

Powerful—The motor is 4-cylinder, long stroke, especially built for heavy duty. Able to meet the call of extra load or extreme grade. Has a power reserve for all secondary operations.

Strong—The bumper is heavy oak, the frames of channel section pressed steel. Every piece of material in the Kelly Truck is carefully selected and rigidly tested.

Durable—All vital parts are protected from damage in collision or accident. The entire drive is enclosed, which protects it from dust and insures proper lubrication to all bearings.

Flexible—Kelly Trucks have no rigid cross members in frame back of seat. Motor is 3-point suspension—front of base solidly attached to sides of main frame, third flexible point being at rear. Jack shaft is 3-point suspension, making whole unit 6-point.

Simple—The fewest parts and all accessible; easy to operate, hardest to misuse.

Economical—In gasoline, oil, tires and repair charges, Kelly Trucks have made low records. Depreciation percentage is exceptionally light.

Real Service—Kelly users are taken care of wherever they are—at all times—if it's help, advice or extra parts they need. Who buys a Kelly buys the best, most efficient and complete service organization in the country.

The Complete Line—1½, 2½, 3½, 4, 5 and 6 Tons.

"Like Kelly Does"—FREE

We want to put your name on the free list of this valuable monthly publication devoted to truck transportation (not **all** Kelly). Full of useful information for all truck users—whatever the motive power.

THE KELLY-SPRINGFIELD
MOTOR TRUCK COMPANY
1203 Burt St., Springfield, Ohio

This is a 3½ ton Kelly Truck used by A. & W. Cooper, Detroit, Mich., in general building delivery work.

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BRICK and CLAY RECORD

LINCOLN MOTORS

SIMPLICITY HONESTY

For Brick and Tile Plants

Moisture and mud are part of the day's work in the clay plant and Lincoln Motors are built for just such jobs.

The insulation of the windings protects these motors against dirt, oil and water. This makes it possible to completely submerge a Lincoln Motor and operate it without damage to windings.

There is need for a trouble proof motor like this on every machine in the plant from the clay pit pump to the kiln fan.

"Link Up With Lincoln"

A standard Lincoln Motor has been operated under water for nearly three years without damage to windings.

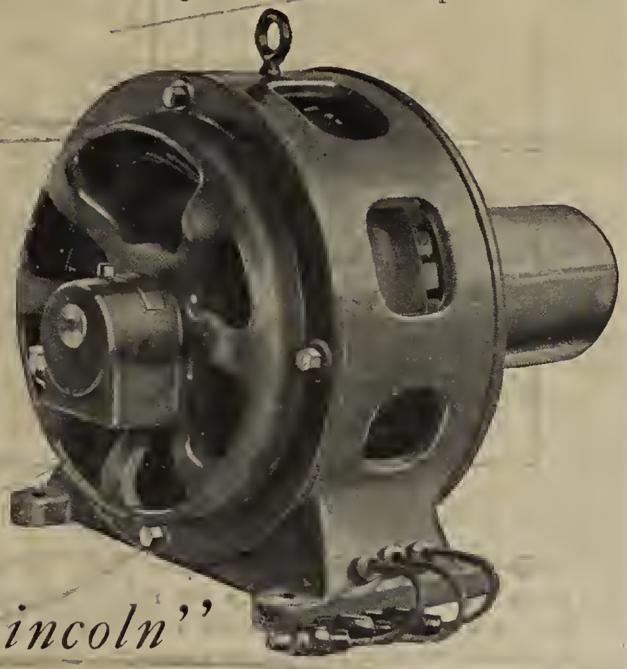
The Lincoln Electric Co.

Buffalo
Detroit
Chicago

Cleveland, Ohio
Toronto, Canada

Philadelphia
Columbus
Pittsburgh

Agencies in other principal cities.



Vol. XLVIII, No. 6 Chicago March 21, 1916

WELLER-MADE

WHICH?

Old Style Methods

20 to 25c per ton

To get coal to boiler house and to kilns required two horses, two carts and an average of four men.

For Retail Trade it took wagons or auto trucks from 70 to 90 minutes from time they drove into yard until they weighed out.

Demurrage frequently amounted to from $15.00 to $30.00 per month.

Loss from coal falling between cars and wagons was a serious item.

Loss from theft was large.

In Gondola cars—5c to 10c premium.

New Style Methods

3 to 5c per ton

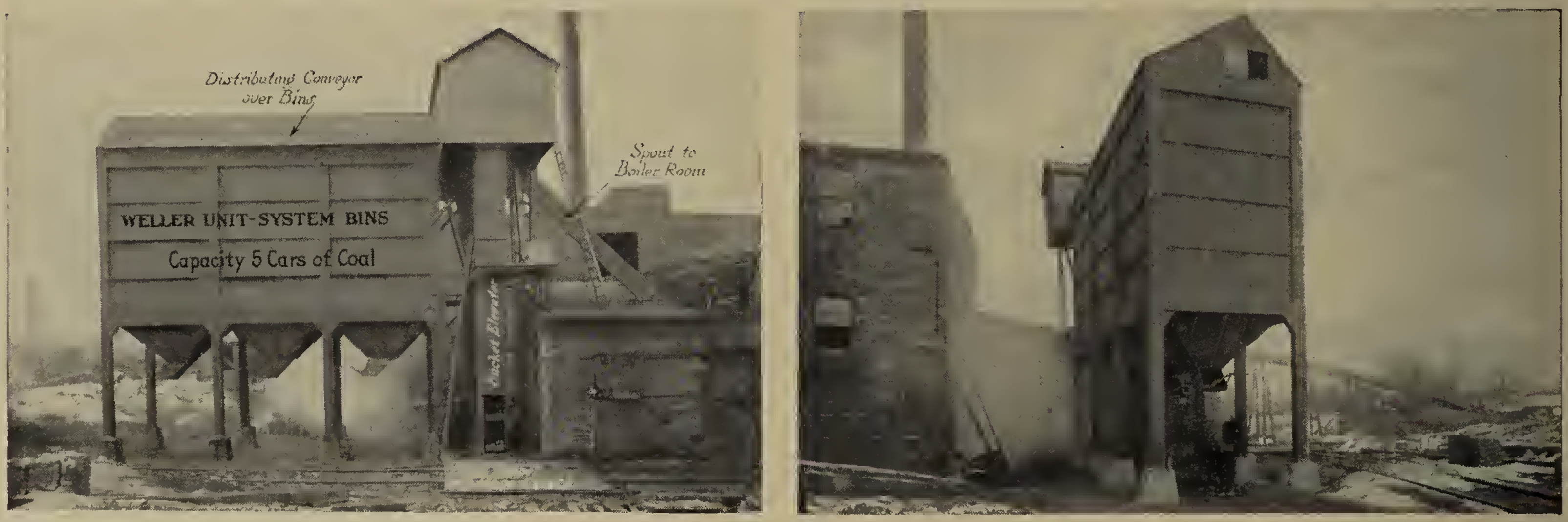
One man, with one horse and cart, supplies all kilns **before noon.** Coal for boiler room is spouted direct, no labor.

Average time regardless of size of load—**10 minutes. Saving one hour.**

Demurrage
Loss } "Ain't none"
Theft

Hopper-bottom cars—saving 5c to 10c.

It is up to you to say what your coal handling will cost



Coal Handling Plant L. W. Camp Co., Akron, Ohio

Each plant has certain peculiarities so that it is impossible to lay down any set rule. Certain general principles are always involved which simply require a combination of certain of our standard equipment properly assembled to meet the conditions.

There is a shortage of satisfactory labor in many localities and if something is not done to offset this condition, many clayworking plants will be up against a serious problem during the coming season and it is better to get ready now.

If it is handling coal, clay, shale or other material around your plant we can and will help if given a chance.

We know how to, and do, build good

Elevating, Conveying and Power Transmitting Machinery

WELLER MFG. CO. **CHICAGO**

SAY I SAW IT IN BRICK AND CLAY RECORD

BRICK and CLAY RECORD

Entered as Second Class Matter January 2, 1911, at the Post Office, at Chicago, Ill., Under the Act of March 3, 1879.

Terms of Subscription
One Year—(24 Numbers)
United States......$2.00 Foreign $3.00
Single Copies.......25c

Published the first and third Tuesdays of each month by

Kenfield-Leach Company
445 Plymouth Court Chicago

Chicago, March 21, 1916

Vol. XLVIII No. 6

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Standards of Practice for Business Publications

The publisher of a business paper should dedicate his best efforts to the cause of Business and Social Service, and to this end should pledge himself: 1. To consider, first, the interests of the subscriber. 2. To subscribe to and work for truth and honesty in all departments. 3. To eliminate, in so far as possible, his personal opinions from his news columns, but to be a leader of thought in his editorial columns, and to make his criticisms constructive. 4. To refuse to publish "puffs," free reading notices or paid "write-ups;" to keep his reading columns independent of advertising considerations, and to measure all news by this standard: "Is it real news?" 5. To decline any advertisement which has a tendency to mislead or which does not conform to business integrity. 6. To solicit subscriptions and advertising solely upon the merits of the publication. 7. To supply advertisers with full information regarding character and extent of circulation, including detailed circulation statements subject to proper and authentic verification. 8. To co-operate with all organizations and individuals engaged in creative advertising work. 9. To avoid unfair competition. 10. To determine what is the highest and largest function of the field which he serves, and then to strive in every legitimate way to promote that function.

The EDITOR'S CORNER

Comment, Criticism and Advice on Live Issues Affecting the Manufacture, Marketing and Manifold Uses of Burned Clay Products

SOMEWHAT more than a year ago this magazine took up the "Buy it Now" slogan and tacked it onto the man who owned a clay plant. About that time, the clay plant owner was interested in the "Build Now" slogan, one that was destined to bring increased business in burned clay building materials.

Today, the building impetus has set in. The tide is so strong that even the soaring prices of structural steel, the embargoes on eastbound shipments, the shortage of labor and a hundred and one things that would ordinarily discourage the improvement of real-estate, have failed to stem it.

So much for the excellent market conditions that confront the man who has building material to sell.

Reports that have reached us, show that many—a great many—of our readers saw the handwriting on the wall, and heeded the "Buy it Now" advice. Those who were early in response to that good advice, bought at a bargain.

Not only were deliveries prompt, but prices were lower than now—much lower. And the new machinery and equipment is working, earning a big interest on the money that was invested in it.

Touch clayworking machinery, and you touch steel. Steel is advancing. Orders are being taken—not sought—for delivery in July and August. The shortage is calculated at approximately a million tons.

And the end is not yet. So it is, that at this time, when the building boom is on, and when the materials that go into clayworking machinery and equipment are higher in price than has been known in a generation, that "Brick and Clay Record" comes to you again, adding one word to the old slogan, and making it——

"Buy it Now"—*now*.

Now heed this. Not only does it apply to machinery, but to the last little accessory that you should be buying, while you are merely thinking about it —or putting it off.

You will get better prices—better deliveries—better service, today, than you will get two months from today.

The building world will be calling for your material then, and you will have your plant speeded up to its fullest capacity. The capacity is limited to your machinery and other equipment.

The earlier you buy, the better you will buy. The sooner your order is placed, the sooner you will secure the equipment you need—and the sooner it will go to work for you, earning big returns in a rising market.

Your Opportunity

FOUR DAYS—April 17 to 20—have been set aside by the New York State School of Clayworking and Ceramics, Alfred, N. Y., as a time when the manufacturer of burned clay building materials and of pottery can leave plant and office duties, and turn to the schoolroom for a replenishing of ideas and the gaining of new knowledge.

That the expense of attending this course will be an investment that is bound to bring big returns, is indicated by the character of the teachers who will have a part in the well-planned program. Profs. Bleininger, Binns, Montgomery and a host of others, need no introduction to our readers and that their lectures will be of the greatest value, is a foregone conclusion.

Just two months ago, on January 22, a very comprehensive and painstaking short course in ceramics came to a conclusion at the University of Illinois. Eleven days—full eight-hour days—and two evenings, were occupied by the classes which were taught by able professors and men of wide experience in the ceramic field, many of whom came from a great distance to perform their part in the program.

All for what?

Exactly twenty-three men, the majority of whom are actively engaged in clayworking, attended this short course, and only eight of these registered as coming from Illinois. The remaining fifteen came from various other points in the country, including states as far distant as Oregon, Texas and New York.

In justice to those who had the wisdom to see the advantage in attending these classes, it can hardly be said that the course was a waste of time. Letters testifying as to the value received from the lectures have some time since made their appearance in this magazine.

However, when one thinks of the time and energy spent by the able corps of teachers at Urbana on twenty-three students, when they might just as easily have taught many times that number, it does seem as tho it were an excessive cost to impart the knowledge that was given.

Inspection of many of the plants engaged in the manufacture of burned clay materials discloses the fact that there is yet considerable room for improvement, so the excuse of "nothing to learn" can hardly be offered for not attending these short courses. More than likely it is a case of "no time to spare."

While the course at Alfred comes at a season when most plant owners are busy with spring orders, this should not stand in the way of its success. If you, as owner, manager, or superintendent, do not feel that you can attend personally, send your boy, some promising young man on the plant, or a faithful employe who needs to stock up on new ideas.

Board and lodging can be had for a reasonable sum in Alfred, to which need be added the railroad fare.

If a clayworker who operated in California, attended this course, and while there learned of a way to cut his costs, reduce his "seconds" or raise the price of his product, the trip could scarcely be called a waste of time and money.

Car Shortage

NOW that we have "blown off steam" on the freight traffic situation in the East and have had two weeks to think it over, a new phase of the problem has put in appearance—that of co-operation to reduce the consequent car shortage.

Reports of a lack of sufficient cars are becoming more numerous, some plants, particularly those on the Atlantic Coast, being unable to make shipments. As a result, progress in building is being hampered because of an inability to get material on the job promptly, or at all.

Nothing is more effective in advancing prosperity than good transportation facilities and an adequate freight car supply. The transportation facilities of the country, according to the railroads, are good, and the car supply, if effectively handled, is sufficient.

Indications are that an increasingly severe car shortage will prevail in the near future unless strenuous and united efforts are made by the railroads and their patrons to reduce the standing time of freight car equipment by a quicker loading and unloading of cars.

The average time required for loading a car by a shipper is about two days and unloading it by the consignee about two days, or a total of four days. If this could be reduced to three days, a material gain in available equipment is made, resulting in shippers being able to market additional business to that extent. The reduction in standing time results in fewer cars standing in yards or on private tracks, materially reducing the possibility of congestions which are expensive to shippers and receivers as well as to the railroads.

Here are some of the ways in which clay plant owners can materially assist in this vitally important matter:

1. By not ordering more cars than are actually needed.

2. By loading cars as quickly as possible to full capacity and furnishing billing promptly so there will be no delay in starting the cars to destination.

3. By loading a car properly so at it will not be necessary to delay it in transit adjusting the load or transferring it to another car.

4. By loading or unloading cars as soon as placed, regardless of free time allowance.

5. By notifying carrier as soon as cars are loaded or made empty and ready to move.

6. By not using a box car when a gondola or flat car will serve, as box cars are usually in greater demand.

7. By endeavoring to have reconsigning orders placed in advance of arrival of car so it may be switched to the proper track on arrival, instead of being placed on a yard track awaiting disposition.

There are equally as many ways in which the carriers can help reduce the freight congestion and car shortage that now prevail. If both shippers and carriers co-operate in this matter, there is little doubt but that existing conditions can be greatly improved.

"Help Ye One Another"

WHEN you help a fellow-member in the industry with which you are identified, you help yourself.

There is no long road of reasoning to travel in order to see the application of this truth to the carrying on of business in this twentieth century. It is simple and direct. By imparting the knowledge you have gained thru experience to a brother-worker-in-clay—even tho he be a competitor—you will do yourself a service by making that competition less ignorant and, therefore, less disastrous.

One of the noteworthy features of the American Ceramic Society Convention held recently in Cleveland, was a willingness on the part of those present to tell what they knew about certain methods and processes for the benefit of those who were in trouble. As one member put it:

"Even a casual observer would have been impressed with the fact that the men presenting the papers, and taking part in the discussions, were making a real effort to give information that would be of service to their fellow members."

Such a spirit is certainly gratifying. How it stands in marked contrast to the policy so apparent in deliberative gatherings of the years gone by.

Many will read and say: "Fine. Great stuff. Glad to see it;" while they are hiding away little parcels of knowledge that are labeled "Trade Secrets" for fear that a clayworker operating an adjacent plant will learn of a better way in which to prepare his clay, adjust his dies or burn his ware.

Get out from the dark corners of Medieval narrowness, into the light of day. While it may blind you at first and cause you to hesitate, persist in your course of broadmindedness, and be the stronger and better for it. The result will come in a newer and easier competition—that of quality and service.

The Truth About Cost

COST is a part of your business which has received so much discussion, both helpful and otherwise, that no one seems to quite understand what it means. While a uniform system of cost-keeping is probably the best solution for a good many of the brickmaker's ills, it is a fact that, because of pride, many a manufacturer is loath to disclose what certain divisions of manufacture are costing him.

When a man makes a mistake he usually wants to cover it up as quickly as possible. So it is with some part of the work that is not being accomplished as economically as it should. Having resigned himself to the belief that there is no avenue of escape from an excessive cost, the clay products manufacturer seeks to "humbug" himself in to the fallacy that it cannot be done any cheaper, therefore, resents any movement that tends to uncover the fault.

Stop being an ostrich. Pull your head out of the sand-hole of false pride. Get together with the men who are making the same kind of ware and find out what each item is costing them.

Paving-brick manufacturers are starting something in this direction that stands as a good example to other divisions of the clayworking industry.

“SIXTH CITY” MAKES

Cleveland, With Aid of Complete Building of Delegates, Making Nineteen-Sixteen Brick Manufacturers' Association Unparal-

The Prosperous Condition Which Now Rules in the Industry Was Reflected at This Immense Gathering by the Numerous Orders Placed for New Equipment With Which to Take Care of a Record-Breaking Volume of Business

Hotel Statler—the Hostelry That Fairly Bulged with the Visiting Horde of Brickmakers

THE THIRTIETH annual convention of the National Brick Manufacturers' Association was held in Cleveland, Ohio, February 23, 24 and 25, 1916. The actual number registered was 639, not including the ladies.

The first session was called to order Wednesday afternoon, with C. P. Mayer, of Bridgeville, Pa., in the chair. The Rev. Louis F. Ruf, of Cleveland, invoked the Divine blessing.

Owing to the illness of Mayor Davis, the address of welcome was delivered by the Director of Public Service, who was followed by the Director of Public Welfare of the City of Cleveland, a reply on behalf of the visiting brick manufacturers being delivered by H. C. Kleymayer, of Evansville, Ind.

C. P. Mayer then delivered the

President's Annual Address

It is a time-honored and worthy custom for the presiding officer to present to you on the anniversary of his election an annual address or message dealing with matters which he thinks of importance to the clay industries, and I am glad to submit to you today some thoughts which to my mind are of particular importance just at this time.

The one thing uppermost in the minds of everybody these days, it seems, is preparedness. Preparedness as a nation, preparedness in industrial affairs and preparedness as individuals, is desirable that we may solve the problems that come to us in a business way. If the clay industries of the land are prepared to meet the demand for better building materials, a prolonged era of greater prosperity and activity will come to us as individuals.

To my mind, the work of this association tends directly toward preparedness, for the purpose and object of our annual meeting is not merely to have a good time, though those of us who take an active part in the convention certainly do enjoy ourselves. On that score alone, I think it is well worth while to attend these yearly meetings, but there is something beyond the mere element of pleasure. As a source of widening our vision and knowledge of business affairs, these meetings are of great importance.

THE PRINTED TRANSACTIONS

I have been impressed with this of late, because I have been looking over the proceedings of former conventions. If every clayworker in the land would do the same and reread some of the many splendid papers and addresses included in our printed proceedings, I believe they would profit very much. Few of our active members even properly appreciate the importance of our printed proceedings. I am inclined to think that many of us do not give serious thought to the technical papers presented for our consideration as we should. We listen to the papers as they are read, are impressed, applaud the speakers, pass resolutions of thanks, and then forget them.

That to my mind, is one of the reasons why the association and its officers are sometimes criticised by those who, from lack of knowledge, are not in sympathy with the real purposes, nor do they appreciate the accomplishments of this association. If they knew more about the association, its procedure, and its work, they would be less ready to criticise. Criticism of a friendly sort sometimes is helpful, but when it is whimsical and based on envy or a lack of understanding, it is more apt to be hurtful than otherwise. One of my illustratious predecessors once said in addressing this association, “There is nothing quite so easy as criticism or fault-finding.” The great trouble with fault-finders as a rule is they do not look beneath the surface of things—they see the shell, but not the kernel in the shell.

The record of this association is of itself the best answer to these critics. Under the direction of the exec-

a RECORD

Show, Att acts Huge Throng Convention of the National leled in Point of Attendance

utive committee, the association has kept its course steadfastly as an educational organization. While there have been attempts to divert it at one time and another, they have not been successful, and we may properly thank our executive officers for their persistence in keeping this organization as it was originally intended, free from personal or trade influence and strife. The good Lord knows there is enough of that element injected into our local affairs, and we do well to keep as far from it as we can in these national gatherings.

Speaking from my own personal experience —and you know this is my fourth year of service as an executive officer, having started in as third vice-president in 1912—I want to say a word of approval of our procedure as relating to the selection of our executive officers. Whoever conceived the idea or plan under which we have been operating for several years, understood the power and influence of continuous effort. Our system of promoting a man from third vice-president on up is most commendable, for it insures more thought and consideration for the welfare of our association than would be possible if an executive officer was chosen to serve a single year, because of some local of temporary influence. I have profited personally by my official connections, and I think every officer, those who have preceded me and those who are following after, will heartily concur in this judgment.

THE EDUCATIONAL VALUE OF TRAVEL

I was reading in a current magazine an interesting article on "Captains of Industry," in which Mr. Patterson of Dayton, Ohio, who made such an enviable reputation during the flood calamity which overtook that city, was referred to as a high type of citizen, but as a man of peculiar habits. The writer said it was Mr. Patterson's custom to reach the factory of the Cash Register Company, of which he is the head, at 7 a. m. six days in the week, and that he busied himself at the plant until 12 noon, at which time he invariably left the plant, devoting the balance of the day to rest and recreation. Now, that is perhaps a pretty good scheme for the man at the head of a great institution of that sort, but we brickmakers would "bump the bumps" if we tried to run our business on any such plan. Mr. Patterson is said to have a fad which most of us might adopt with profit. He believes in travel as an educator. The story I read stated that in talking to one of his faithful employes he found that he had never been to New York City, so he promptly gave him two weeks' vacation on pay, told him to visit Washington, New York and Boston and render a bill for the expense of the trip to the company. The young man, of course, was greatly surprised and asked what he was to do on the trip to justify the expense, and Mr. Patterson said: "Look, listen and think, and you will gather enough information to make the trip worth while to the company."

There is a good suggestion in this for the managers of plants. I believe it pays well to make trips of inspection. Last spring I visited nearly all the paving brick plants in the country east of the Ohio line and some in Ohio, and I got suggestions and pointers from nearly every one of them that more than paid me for the time and expense of the trip. Clay plants cannot be equipped and run by any set plan or formula, as is the case in many other lines of manufacture, for the reason that our material differs. There are no two clays alike, and consequently no two plants can be just alike, but we can all of us profit by comparing notes and

Euclid Avenue, Cleveland, Which the Delegates Transformed into a "Great White Way" adapting improved methods and labor-saving devices to our own conditions.

I am confident that these annual conventions are a source of actual profit to all of us who come with an open mind and with the purpose of adding to our store of knowledge on the various details of our business. I believe it would pay owners of plants to send their superintendent to these conventions. Indeed, I know some of the older members have made it a practice of doing so, and they have always claimed that it was money well spent.

THE SPIRIT OF LOYALTY

Just at this time, when our boasted civilization seems to have run amuck, and the great nations of the old world are striving to exterminate one another, it seems to me that there is one word we might all of us emphasize and cherish as the most important by-word of the times, and that is loyalty. Loyalty to our nation, loyalty to our industries, loyalty to this organization and loyalty as citizens in our respective localities, insures better conditions for ourselves and for those who come after us.

The spirit of loyalty was well exemplified in the selection of this city as our place of meeting this year. The majority of the executive committee—I know I speak at least for the secretary, Professor Orton and myself, for we talked the matter over together carefully—had we followed our personal bent and pleasure, would have urged the selection of Atlantic City, for that famous resort appealed strongly to us from the pleasure side of the proposition, but when the Complete Building Show project was launched, and we were urged in the interest of better building methods and materials to lend the influence of this association to that undertaking, we laid aside our personal preferences and gave up the anticipated delights of a week at the seashore to accept the call from Cleveland. The splendid assembly here is proof of the widsom of our choice, but, just the same, the majority of our executive committee who made the sacrifice, are entitled to the credit of loyalty to the association and the interests of the industry. If an era of better building follows in the wake of the show, we may feel that our judgment was good and our efforts not in vain.

THE NEW PRESIDENT
Charles J. Deckman of Cleveland, Ohio

Loyalty is a crowning virtue. With a true spirit of loyalty, preparedness will take care of itself; individually as clayworkers and collectively as a nation, we will meet the opportunities and emergencies as they arise and acquit ourselves in a creditable manner and the things for which we stand.

Certainly no industry is more deserving than that of brickmaking. It is no mean industry, as is indicated by the government statistics. It ranks third in the value of annual production, and in so far as the permanent wealth of the nation is concerned, it really stands first, for structural materials of burned clay become a permanent addition to the nation's wealth. It is the only manufactured material of which this can be said. The value of the coal mined exceeds the value of clay products, but the coal is consumed, it goes up in smoke, and that ends the existence of the coal, except paying the bill. The same is true in a measure of all other manufactured products, for their use means their consumption, while brick, tile and terra cotta are indestructible and the products of today will be in evidence for generations to come. The work of other industries are temporary in character. Lumber decays and must be renewed. Steel rusts and must be replaced with burned clay. We build for all time to come. The brick in this beautiful hotel, for an illustration, may be taken down and used again a hundred years from now, if it so suits the fancy and desire of the generation of that day. There is every reason why we should be proud of our industry and loyal to its every interest.

NATIONAL PUBLICITY FOR BRICK

As I have previously stated, the work of this association has been educational, with a view of producing better products in larger quantities and at lower cost, and this, I think, is as it should be. It has of late years been suggested that the time has come when more attention should be given to the market side of the brick business. I have no objection to that idea, but I am firmly convinced that that phase of the business should be considered and managed as a local proposition. The manufacturers in the various states or principal commercial centers may operate with advantage to themselves and the consumers of clay products, but it is hardly the province of a national organization like this to do more than advise and encourage effective co-operation among manufacturers in their own respective localities.

The movement inaugurated at our last convention for the establishment of a publicity bureau certainly deserves the most liberal support of every manufacturer of building brick. While I, myself, do not manufacture building brick, I was so much interested in this movement, which was inaugurated while I was president, that I went to Indianapolis at my own expense and attended the meeting of the committee which I appointed for that purpose. Most of the delegates appointed were present, and evinced much enthusiasm, pledging themselves and their associates to the active support of the bureau. I made it my business to bring the matter to the attention of the Pittsburgh Clay Club before and after the Indianapolis meeting, and on my invitation Secretary Randall came to Pittsburgh for the same purpose and presented the proposition to the members of the club. They, one and all, agreed that the work contemplated was very important, but when it came to pledging financial support they quibbled. I paid my portion as a member of the club, and have repeatedly urged the officers and members of the club to do likewise, but up to the last report I received, only twelve of the thirty members of the club had done so. One thousand dollars was pledged, but only $225 of same was actually paid. If the same conditions prevail in other brickmaking centers, our efforts to boost the industry cannot be as effective as they should.

If we compare this feeble effort—feeble because brickmakers are so slow to respond to what they admit is an important movement in their own interest—to the liberal support accorded by the lumber and the cement interests to their organizations, it is not hard to understand why those interests grow and prosper, while ours seem to lag and languish. I wish I had the power to awaken the building brick men of the nation to the importance of concerted effort. As your chief executive, I have done all I could do to that end. I hope my successor may be able to do more than I have in this direction. However, I have my consciousness of having done my best.

THE CRAFT A FAMILY AFFAIR

I have taken both pleasure and pride in my official connection with this organization. It has been a great help to me, and I propose to prove my appreciation for the honor and consideration shown me, by doing everything I can to promote the interests of this association and extend its field of usefulness. While I have other irons in the fire, I expect to continue a brickmaker as long as I live, and I expect my sons, who are now with me in the business, and their sons, to follow in my footsteps. I think that they will in their turn contribute their mite of loyalty to this organization, just as I have tried to do.

I am yet a young man in feeling and ambition, and tho after this session I will be a "has been" officially, I hope to continue to do my full part in maintaining this organization as an active influence for the betterment of the entire clay craft, just as some of my very worthy predecessors have done and are doing.

I feel that as an ex-president I am in very good company when I come to these annual meetings and stand shoulder to shoulder in solid phalanx with Ittner, Richardson, Gates, Eisenhart, Blair, Conway, Gregory, Parker, Rogers and others who are always found present and attentive at our sessions. It is to these faithful leaders and the untiring efforts of our faithful secretary that this organization owes its long life of usefulness.

This is our thirtieth anniversary, and thirty years is a long, long time in the life of men and an industrial organization. It is said there is only one way to judge of the future and that is by the past. The association has been a power for good in the past, and I am optimistic enough to believe that it will be just as successful in the future. I will soon take off my black cloth and hand this gavel to my successor, don the red and again take my place among the rank and file of the membership, but before doing so, I want to again thank you, one and all, for the kindly consideration shown me and the cordial support and assistance you have given me in the performance of my official duties. I hope to prove my gratitude by serving this association loyally in the years to come as I have in those gone by.

The Steel Man and the Mud Mixer

In replying to Mr. Fitzpatrick's paper on "Progress and Prosperity," B. W. Ballou, of Buffville, Kansas, told a story that pointed to a trade condition which has a moral. It had to do with a letter which came to a brick manufacturer, and written by a contractor who owed the brick man a very considerable sum of money.

The letter contained a check for $1,000 and, in his joy at receiving so large a remittance, the brick man did not notice, for some minutes, that the check was made out to the order of a certain steel concern. When he found that out, he looked at the letter, and was astonished to find that it, too, was addressed to the steel concern; it disclosed the fact that, altho the steel had not arrived, the contractor had sent a check on account, and humbly—very humbly—requested that the steel concern put a tracer after the cars, as the building was "held up."

A few days later, a letter that was intended for the brick man was forwarded it by the steel concern. It stated that the contractor had received the numerous letters the brick man had sent him, asking for a remittance. That the contractor would pay the bills as soon as the brick were all in the wall, and the architect's certificate issued. That just when this would be was something beyond the contractor's power of prophesy, since the building was waiting for the structural steel. That if the brick man didn't like this way of doing business, the contractor knew plenty of other brick men who would be willing to wait, and would give them preference on future work.

And then, having stuck his knife as deeply into the brick man's rib as was possible, he proceeded to churn it around by adding a post-script to the effect that the brick that were already in the wall were beginning to show a white efflorescence, either caused by the brick itself or by the mortar or the cement backing. So far, the owner hadn't noticed it, but if he did, and there was any reason to believe he would penalize the contractor, the latter would withhold a sufficient amount from the brick man's bill, to cover any contingencies that might arise in the matter.

THE RETIRING PRESIDENT
Casper P. Mayer of Bridgeville, Pa.

Mr. Ballou stated that the thing which hurt the brickmaker most, was that the steel man had seen the letter intended for the brick man, and so had an opportunity of judging in what low esteem the brickmakers as a whole were held by contractors.

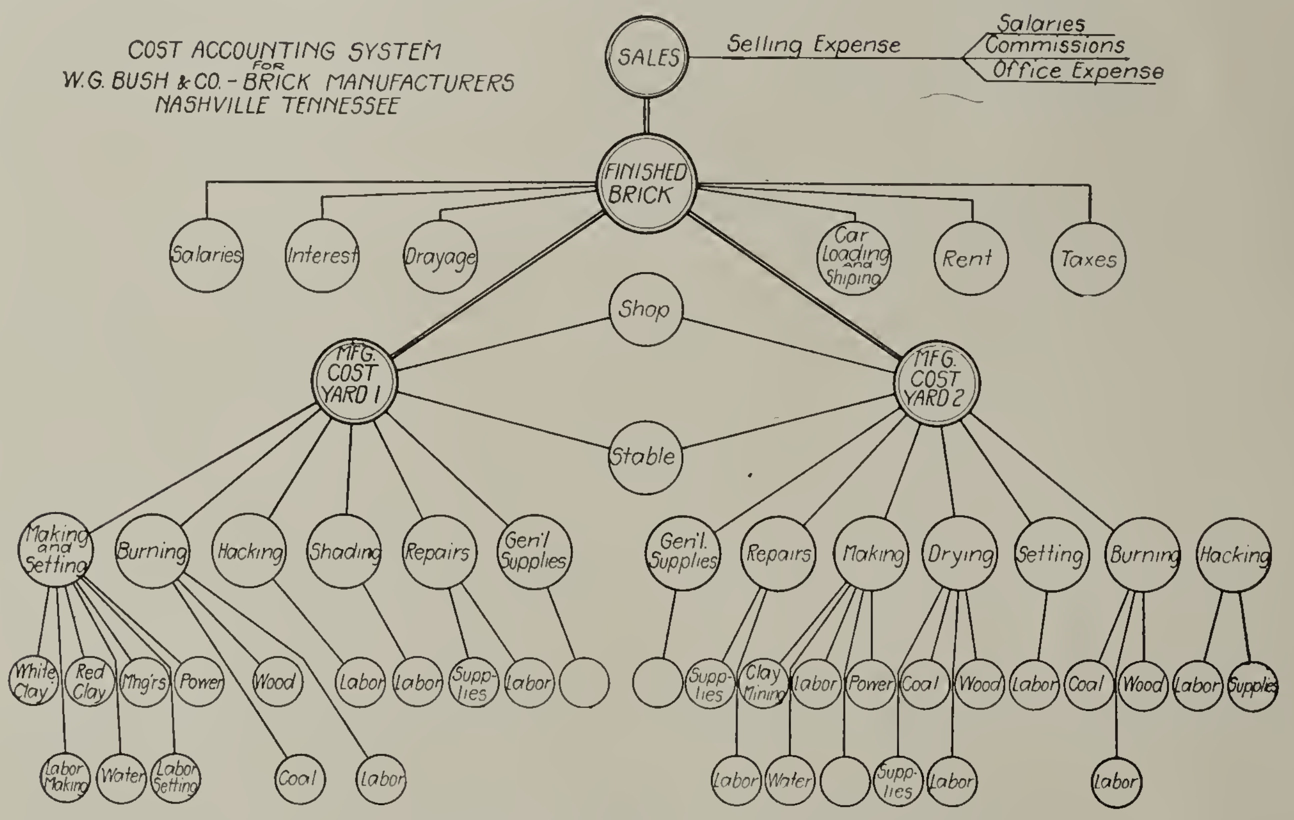


Exhibit "A" (See "The Elements of Cost in Brickmaking")

He pointed out that conditions of this kind are created by the men who sell—not by the men who buy. The steel man made his market jump thru a hoop, while the market made the brick man roll over and "play dead."

Thursday Morning's Session

Hubert Somers of Atlantic City, N. J., opened the Thursday morning session with a very interesting paper on brick plant insurance, which was followed by an illustrated talk given by Edward Orton, Jr., Dean of the College of Engineering, Ohio State University. Professor Orton's paper was elaborately illustrated and it is hoped that it can be published in its entirety in a near subsequent issue of "Brick and Clay Record."

L. K. Brown of Zanesville, Ohio, read a paper on "The Commercial Side of the Brick Business" and said in part:

"The proper location, the proper plan, the proper machine and its mechanically correct placement, are only the installation of equipment. They must be kept constantly in order. The labor element must be properly adjusted and the whole must be maintained at its maximum efficiency. The clayworker of today is awakening from a long sleep. A period of lethargy has preceded his awakening. Obsolete methods are rapidly being displaced by economic devices and systems for the manufacture, handling and selling of his output. From the present indications it will only be a very short time when the type of kilns and methods of burning that are now in use will be obsolete. Already, in the hands of our leading and most eminent engineers, we find the imperfections that prevailed in the past in gas producers and gas-fired continuous kilns being worked out so that a wonderful possible reduction in cost at this end is being demonstrated.

"The well known principles of commerce are fundamental to success. For long years we have had the slogan 'Competition is the Life of Trade.' I prefer that other term 'Co-operation Leads to Enduring Life in Trade.' Thus, in later day American life, the best thinkers are prompting organization dedicated to the holy thought 'Live and Let Live.'

"With economy in manufacture, quality of production, the market field cultivated with energy, intelligence and integrity, the commercial side of the brick business will insure its success by the profit that will be found in the bank balance."

Thursday Afternoon Session

H. B. Henderson, B. Sc., superintendent of the Orton Pyrometric Cone Factory at Columbus, Ohio, read a profusely illustrated paper on clay testing which, it is expected, will be published in full and with the necessary illustrations, in a near subsequent issue of this magazine.

The Elements of Cost in Brickmaking

R. D. Herbert, of the firm of W. G. Bush & Company, of Nashville, Tenn., read the following paper:

When we approach the subject of cost, and by cost we mean unit cost, or cost per thousand brick, I realize that many are inclined to view the subject with more or less suspicion and doubt; as to many it conveys the idea of "red tape," delay and expense, with burdensome and complicated records, not commensurate with the value of the results obtained.

We—and when I say "we" I refer to our firm, W. G. Bush & Company—have been manufacturing brick for over fifty years and have gradually "grown up" with and met the rapidly changing conditions in method of manufacture and the marketing of our product.

We had such experiences in our efforts to arrive at any accurate knowledge of actual cost, that we had almost reached the conclusion that unit cost on brickmaking was a failure. But we did not give up—and today we feel that we have made a long stride toward a solution of the problem of costs so far as our plant is concerned, and we hope that the results obtained by us will be of interest to you.

In treating the subject assigned me, I want to submit the general results of our efforts without going into the minor details. We are operating three yards, which are designated as Yard 1, Yard 2 and Yard 3. In Yard 1 we are making hydraulic-press brick—red, gray and buff—using down-draft kilns; at Yard 2 we are making common brick, operating continuous kilns and direct-fired dry houses; while at Yard 3 we are making press, rough-texture and common-brick. For the purpose of this article, we will consider Yards 1 and 2. These yards, tho entirely separate, are so situated that the shop and stable expense is divided between them. We pay for all labor weekly, yet we make up cost sheets at the end of each calendar month, as we have found that by so doing, we are able to verify our costs with accuracy and at the same time, save office expense.

I present a chart, "Exhibit A," giving a general outline of our accounting methods. This chart practically agrees with our ledger accounts, costs being figured directly from the ledger, and every item on the cost sheet is traceable to the general balance sheet, thus eliminating "estimates." Blue-prints of this chart are in each yard office as a guide for the distribution of labor and invoices for material and supplies, so that each item in the cost may be properly distributed at the time of its origin.

The cost sheet is divided to accord with this chart, that is, into Making, Drying, Burning, Hacking Out, etc. Making includes the cost of red clay, white clay, manganese, water, power and labor. We purchase water from the city water plant. Power—all of which is electric—is purchased from a local power and light company. Clay is all surface-mined; and all mining operations, including steam shovel, mine railroad and the value of clay in the bank, is charged to "Making" at Yard 2, while at the other yards it is charged to a clay account, as all of the clay mined is stocked in the clay sheds. "Drying" includes coal and labor. "Burning" carries wood, coal and labor. "Hacking Out", machine shop, general yard expense, general supplies, repairs and superintendence make up our yard cost, and to this is added administration, or overhead. This covers practically all of our elements of cost as shown on cost sheet. "Exhibit B" is another chart, the data for which comes to our main office in the form of Pay Rolls, Invoices, a Kiln Report and a General Yard Report.

We all know what Pay Rolls and Invoices are, and how quickly they find their way to the cash book, but our Kiln Report is unique in its simplicity and completeness, being simply a record of the condition of the kilns on the last day of the month. The information on this report is taken from the yard record in which is kept the date each kiln is filled, fired, finished and emptied. The data from this report is recorded on the "Kiln Record" kept in the general office and shown here as "Exhibit C." This record gives us a complete check on each kiln and also enables us to ascertain the cost of burning.

For practical purposes we classify the brick in the kilns as green, one-quarter burnt, one-half burnt, three-quarter burnt and finished brick. In continuous kilns this record keeps track of each chamber and is a check on the burning. For illustration we will trace kiln No. 3. On January 31 this kiln was reported as containing 143,200 one-half burnt brick. On February 28 it contained 88,776 green brick. The 143,200 half-burnt were considered in the burning for December as half-burnt, and for January as half-burnt, and in the January production as finished. The 88,776 green indicates that this kiln was finished and emptied and was being refilled. On March 31 the record shows 140,540 three-quarter burnt, indicating that this kiln was finished filling with green brick and that they were three-quarter burned in March and are so taken in the summary. April 30 reported as 119,784 green, indicates that the 140,540 reported as three-quarter burned in March were finished in April and were taken in the cost for April as one-quarter burned. You will note in the column headed "Summary" the 143,200 half-burned is considered in January, that the 140,500 three-quarter burned are considered in March as three-quarter burned and that this 140,540 is brought into April as one-quarter burned.

MANUFACTURING COST YARD 2
MONTH ENDING DEC. 31th 1915.

PRODUCTION-Common Brick				
Green Brick in Dry House	1054.000			
½ Burnt Brick in kilns	180.000			
Finished Brick in Kilns	1108.000			
Loss in Manufacture	37.124			
Cost $3.021 Per M				
COST DETAIL				
Making (1.061.400)				
Coal for Steam Shovel	6.84 Tons @ 1.568	10.72		
Coal for Dinkey	11.4 Tons @ 1.568	17.88		
Power & Light Machinery		158.45		
Water		11.40		
Labor		406.90		
Clay in Bank 1.061.400	@ .05	53.07	658.42	.62
SETTING				
Labor		270.45		2.54
DRYING				
Coal	149. Tons @ 1.568	233.63		
Labor		112.00	345.63	.325
BURNING 1,198,000				
Coal (Slack)	108.02 Tons @ .942	169.58		
(R.M.)	165.89 Tons @ 1.568	260.11		
Wood	56 Cords @ 28.24	158.70		
Power		23.08		
Labor		450.55	1,062.02	.886
HACKING OUT 1.061 400		17.50		
MACHINE SHOP		2.04		
GEN'L EXPENSES		50.93		
SUPERINTENDENT		67.50		
SUPPLIES Gen'l.		87.42		.515
REPAIRS Gen'l.				
Material		86.38		
Labor		235.85		
PRORATA OF OVERHEAD EXP.		447.58		.421
		3331.72		3.021

Exhibit "C"—"The Elements of Cost in Brickmaking"

In order to ascertain the burning cost per thousand, we divide the total cost for burning by the equivalent of finished brick. For January we have 143,200 half-burned and 292,900 finished, which would be the equivalent of 364,500 finished brick. The cost, $423.58, divided by this equivalent, gives the cost per thousand of burning for January.

The summary for February shows nothing burned, but March shows 151,296 one-quarter burned in kiln No. 4 and 140,540 three-quarter burned in kiln No. 3. The 140,540 three-quarter burned equals 421,620 quarters. Add to this the 151,296 one-quarter burned, which makes 572,916 quarters. Divide by four, which gives 143,229, which is the equivalent in fin-

KILN RECORD - COST OF BURNING

	Kiln Nº1	Kiln Nº2	Kiln Nº3	Kiln Nº4	Kiln Nº5	Kiln Nº6	Kiln Nº7	Summary	Equivalent of Finished	Burning Cost	Per M	Remarks
Jan. 31st												
Green	118500	Dec				174400	Dec.					
¼ Burnt		E		E	E		E					
½ Burnt			143200					143200				
¾ Burnt												
Finished	118500					174400		292 900	364 500	$42.358	1.162	
Feb. 28th												
Green		4 920	88 776					93 696				
¼ Burnt				E	E	E	E					
½ Burnt												
¾ Burnt												
Finished	115 500							115,500	None	$ 40.85		
Mar. 31st												
Green	76 124	141,864			155 732			373 720				
¼ Burnt				151,296		E	E	151 296				
½ Burnt												
¾ Burnt			140 540					140 540				
Finished									143 229	$530.70	3 70	
Apr. 30th												
Green			119 784			171 980		291 764				
¼ Burnt				E			E	140 540				
½ Burnt												
¾ Burnt								151 296				
Finished	122 536	141 864			155 732			420 132	568 739	100034	1 758	

Exhibit "B"—"The Elements of Cost in Brickmaking" ished brick. April summary shows the 140,540 from March three-quarters burned as one-quarter burned and 151,296 from March as one-quarter burned as three-quarter burned. Thus we have for April:

One-quarter burned	140,540
Three-quarter burned	151,296
Finished brick	420,132

The 151,296 three-quarter burned is equal to 453,888 brick one-quarter burned: add this to the 140,540 one-quarter burned and we have 594,428 one-quarter burned. Reduce this to its equivalent in finished brick by dividing by four and we have 148,607, which is the equivalent in finished brick. Add this figure to the actually finished brick, 420,132, and we have 568,739, which is the equivalent of finished brick for April. The total cost for burning $1,000.34, divided by 568,739 gives $1.758 per thousand as the cost for burning for April. This method is continued thruout the year. The same process is followed with the continuous kilns in handling the chambers, and with slight modification, the cost of mixed kilns.

In order to keep up with the actual merchantable product, we absorb the several items of waste, i. e., at the machine, in the kilns, in stocking, and in car loading. The actual waste of green brick at the machine and thrown back in the clay, gives us the waste of labor and power, which is absorbed at the machine by reducing the make to the number of good brick for the day, and we look to the foreman to reduce this waste or assign a reason for it—and we all know there are many reasons assigned for this waste.

The waste in the kilns may come from poor setting or poor burning due to atmospheric conditions, etc., and while this is absorbed in the cost of burning, yet the head burner is called upon to explain. The item of waste in shading or stocking and loading is sometimes traceable to burning. While we are dealing with totals, we never lose sight of our unit—per thousand—so if the machine makes 1,000 brick and 900 are set, the cost for the machine register of 1,000 is figured on actual brick, 900. Of this 900, if 100 are lost in burning, the cost of burning is for 800, and if 50 of these are not marketable, we have 750 finished brick from the machine register of 1,000. You will remember that these figures are for the purpose of illustration and not from our records, as our percentage of waste has not quite reached these figures, and at present is getting further and further away from them. Our cost in dollars and cents is on the basis of finished marketable product.

The waste handled in this way, holding the department in which it occurs accountable, we have found is making for greater efficiency on the yard. It has put "a watchman on the job," and is taking up the lost motion from the manager to the car loader. It is not only enabling us to go into the market knowing the cost of our product, but it is also tending to reduce that cost.

It was remarked on the floor of this convention last year "that if every clay manufacturer could know the exact cost of his product for each pay-period, and bring his average cost for the year down to date, it would be the greatest stimulant to prices that we could possibly get. Without a cost system employed in our office, we are bound to let our competitor set our price." I heartily concur in this opinion and feel that as an association we should take active steps in this direction.

"What's the Matter With the Brick Business?"

William B. Wreford, secretary of the Detroit (Mich.) Brick Manufacturers' and Dealers' Association, then delivered a paper which had particular interest. It was as follows:

You have all heard the old familiar cry—"What's the matter with Jones?"—or Brown, or Smith, as the case might be, at gatherings of various kinds; and you all know the answer. Since there is nothing new under the sun, the same thought goes for the title of this paper, and it becomes "What's the Matter with the Brick Business?"

The answer, too, is much the same as that which greets the inquiry as to Jones, or Brown or Smith—and is given to cheer a good fellow, who, perhaps, is far from being "all right."

The daddy of all building materials is in excellent business health, but if you were to take any individual, teach him a trade, and then tell him to sit back and take what came to him, absolutely without effort—and without complaint—that individual would soon fret himself into an illness.

The same may, and is done in an industry, for the life of any industry is in its progress—without progress it is life-in-death and final demolition.

I do not think that there is any one man in the country who can tell us exactly what the "matter" is with the brick business. Each of us can tell what has happened to it in the particular locality in which he is working—each can point to instances of success here and there—successes caused by certain circumstances peculiar to that one locality. We go, however, into the realm of theory when we say that principles which have been successful in one place, may be applied anywhere, and be sure of a similar joyous outcome.

And while a man may talk pleasantly on theories, he talks convincingly only upon such subjects as he has

Where the "Quality Product at a Competitive Price" Won Out. A Hollow-Tile Silo, at the Right, on an Iowa Farm, That Replaced the Wooden Stave Silo at the Left. The Latter Could Not Measure Up to the Standard of the Former, Especially in View of the Very Small Difference in Cost. (See Prof. Homer F. Staley's Talk on Page 532)

touched with his hands or seen with his eyes. Therefore, I am going to try to deliver a message which I hope will be more convincing than pleasant, and will confine myself to organization work, *as done by an association in which I have worked and am working.* What I tell you will be literally the things that I have touched and seen.

With your indulgence I am going to tell you what has been done thru a local organization in Detroit, known as The Detroit Brick Manufacturers and Dealers' Association, operating since a year ago last September. Partly as the result of the work of this association, it was necessary for every brick plant in Detroit to work full force during the past winter in order to prepare for the present demand and the rush of the spring building season. There is nothing very difficult about the work of the association. In order to show you what they are doing, I have prepared a few slides. Here are some of the lines of endeavor that are being followed:

During the first year we paid for 1,000 inches of newspaper advertising and as the result of this we had 2,000 inches of free publicity published. Let me call your attention to the fact that names of brick manufacturers are not used in any of the copy.

We have what we call a building sign, a card 22x28 inches, which is placed on every brick building under construction. These signs cost $2.80 per hundred.

Then there is our road sign. These signs are placed on all roads leading into Detroit with the arrow pointing toward Detroit. These signs are 14x22 inches and cost $2.00 per hundred.

The wagon sign is used on all wagons that haul brick.

The poster stamps, of which there are six designs, are used by the various brick manufacturers and dealers in the city on correspondence. They are also used on the boxes of matches distributed. The matches are to be found in all the clubs in the city. They are also distributed to cigar stands in the prinicipal buildings in the heart of the city. They cost $1.50 per thousand in sets of six.

The telephone pads are on the telephones of all architects and contractors in the city. They cost 21 cents each.

The cigarettes are used at banquets and social gatherings of architects, the builders and trades' exchange and real estate board. They cost 18 cents a box.

The blotters are distributed monthly through the principal office buildings in the downtown section and the architects, contractors, and real estate dealers outside the half-mile circle are reached through the mails. The blotters cost $6.25 per thousand.

The back of the Detroit building code carries the "Build with Brick" advertisement. The cost is $300 per year, 5,000 copies being printed by the publishers.

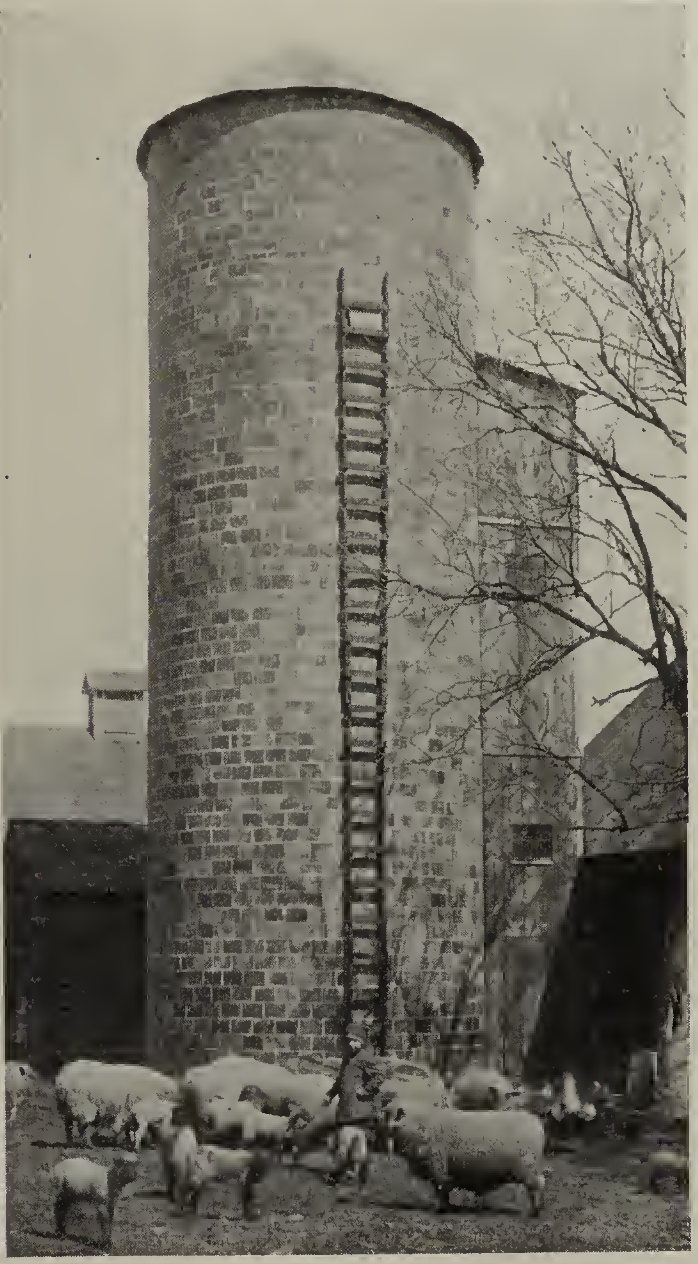
A "Made to Order Fire," is a booklet written about Chicago celebrating fire prevention day by burning two houses, one of brick construction and one of frame construction and compares the results after the fire.

Our test booklet, known as "Practical Tests," contains facts pertaining to brick and hollow-tile construction. These tests were conducted under the supervision of Professor F. N. Menefee, in charge of the Materials Testing Laboratory at the University of Michigan. These tests cost about $3,200. A copy of the booklet has been supplied to all architects, contractors and builders in the city of Detroit.

A rest room was maintained at the Michigan State Fair last fall at a cost of $297.35. This room was made entirely of Detroit-made common-brick. It was so popular that it will be made an annual feature.

Space has been retained at the Builders and Traders Exchange permanent exhibit at a monthly cost of $35. An architect is now at work drawing plans for a miniature brick house to build of miniature common-brick.

Last, but not least, the booklet supplied by the National Building Brick Bureau. This booklet contains information relative to the history of the brickmaking industry, in addition to the twelve designs for brick homes. These designs were selected from among the ones that were submitted to the Indianapolis "Star" during its recent competition for the best drawings for brick homes to cost not over $7,500. All Detroit architects and contractors have been supplied with a copy.



A Hollow-Tile Silo with a Five-Inch Wall at Redfield, Ia. In Addition to Being a Receptacle for Silage, This Structure Supports a Three Hundred and Fifty Barrel Water Tank on Top. (See Prof. Staley's Talk on Page 532)

This gives a general outline of our activities in Detroit, which you see are simple publicity and advertising work that can be successfully handled in any community. In order to show you that the cost is not excessive I am showing you herewith a budget amounting to $10,000.

A SAMPLE "BUDGET"

Office rent	$ 500.00
Office supplies and maintenance	450.00
Salaries	3,800.00
Newspaper advertising	2,800.00
Booklets	500.00
Mailing costs	175.00
Other printing	300.00
Cuts	100.00
Outdoor advertising	950.00
Outdoor signs	75.00
Papers and magazines	50.00
Miscellaneous	500.00
Total	$10,000.00

In Detroit a brick man has just served his year as president of the Builders and Traders' Exchange, another is director of the Board of Commerce and president of the Public Lighting Commission, another is a fire commissioner, another is a building commissioner and has recently been elected president of The Michigan State Fair Association, which holds its annual fair at Detroit.

The last word I have to say is on the everlasting question of price. My suggestion along this line is to create a demand and the price will take care of itself. So I don't talk price, but I do talk cost. There is an old saying—"You can't make money without spending it." There never was a truer word written. Trade conditions have proved it, time and again. In Detroit, we understood that, in the very beginning. We spent money, now we are making it and—speaking for Detroit—the brick business is absolutely all right.

Friday Morning's Session

J. G. Bragg of the Pittsburgh Testing Laboratory read an illustrated paper on the transverse tests of brick in relation to the strength of piers and was followed by E. C. Hillyer of Raleigh, N. C., who spoke on "Efficiency Engineering for Brick Plants."

Homer F. Staley, A. B., Professor of Ceramic Engineering at the Iowa State College, spoke without notes and in explanation of a series of remarkable photographs which were shown in the form of lantern slides. Professor Staley's talk for the main part was an explanation of what might well be called the "Iowa idea" in connection with the marketing of clay products. Here the Agricultural Experiment Station of the Iowa State College had worked so closely with the manufacturers of clay products in the Hawkeye State as to convince them that it was better to sell "quality goods" at competitive prices than to attempt to secure "quality prices" for high grade material.

In illustration of this he explained that when the Experiment Station first took hold of the matter of clay silos, it found that the manufacturers of clay silo blocks were recommending walls eight inches in thickness. This made the cost of clay silos higher than the cost of either cement or wood stave silos.

When it was found that, by reinforcing with wire, burned clay blocks four inches in thickness could be used and that silos built with four-inch walls were able to stand all of the pressure brought upon them by the weight of the silage, the manufacturers eventually admitted that it was better to take a large number of orders for a small quantity of burned clay in each instance than to pay the cost of selling a larger quantity to a small number of consumers.

As a result of this, it has been found that the clay tile silo can be built in Iowa for about two-thirds of what it costs to build a silo of similar capacity in Ohio. In Iowa also the hollow-tile clay silo can be constructed for a cost which is considerably less than the cement silo and within a very few dollars of the cost of a wood stave silo.

The Closing Session

During the session of Friday afternoon Lemon Parker of St. Louis presented a paper on electric transfer cars and was followed by C. A. Millar of Toronto, Ont., who had for his subject: "Safety First in Clay Products Plants."

In the absence of the author, the paper which had to do with the burning of clay products and which was written by Anton Vogt, was read by a substitute.

J. W. Robb of Clinton, Ind., was elected third vice-president, and if the regular order of procedure be followed in the next few years, will be president of the N. B. M. A. in 1919. Chas. J. Deckman of Cleveland, Ohio, was advanced from the first vice-presidency to the office of president and Fritz Salmen of Slidell, La., and George H. Clippert of Detroit, Mich., advanced to first vice-president and second vice-president, respectively. John W. Sibley of Birmingham, Ala., was re-elected treasurer and Theo. A. Randall of Indianapolis, secretary.

A resolution was adopted advancing the annual dues from $3.00 to $5.00 per year.

Committee on Technical Investigation

The following report was rendered by the Committee on Technical Investigation:

"Your Committee on Technical Investigation at a meeting held February 24 reached the following conclusion concerning their work which they desire to transmit to the society for its consideration and action.

"The Pier Test Investigation: The committee is able to report that some headway has been made during the past year and that the investigation is about two-thirds complete, possibly a little more. Brick from the Pittsburgh and Chicago districts have been secured, piers built, aged and crushed and the data studied. It is important that material for a similar study from one more large district be secured, preferably the New York district. The Bureau of Standards estimates that it will cost $190, expended at the Bureau, to enable them to complete their part of the work. The committee believes that it will be able to secure the necessary brick laid down at the Bureau free of expense. The comparatively small amount of money required to complete this large and important investigation should certainly assure the prompt furnishing of this fund.

"The Natural and Artificial Freezing Test: The committee is of the opinion that an investigation should be undertaken at this time along the lines of the study reported at this convention by Prof. Orton. This work seems to the committee to be of more direct and intimate interest to every manufacturer of building brick than any other problem now attracting attention. The committee desires very strongly to start this work at once and to devote the full amount of this year's appropriation—$250.00—to this purpose, the execution work to be entrusted to Prof. Orton in continuation of and extension of the work already begun.

"Co-Operation with the American Society for Testing Materials: The committee believes that the work they have done on the Pier Test and which they desire now to undertake on the freezing test, will be of very great value and importance to Committee 3C of the American Society for Testing Materials, which is working on the problem of the classification of building brick. It therefore requests permission from this association to enter into co-operative relations with Committee 3C, for the better and more rapid settlement of the problems of the brick industry.

In conclusion, the committee desires to ask that the money available for its use for the current year be increased to $440.00, $190.00 of which to be used to complete the Pier Test, $250.00 for beginning the freezing test."

Professor A. V. Bleininger of the Bureau of Standards, Pittsburgh, Pa., whose term as a member of this committee expired with the present year, was re-elected to serve until 1921. This leaves the committee intact.

BUILDING *with* BRICK *amid* BANDIT SHOTS

Border Unrest Fails to Quench Brick Building "Boom" in El Paso—The Gateway to Mexico

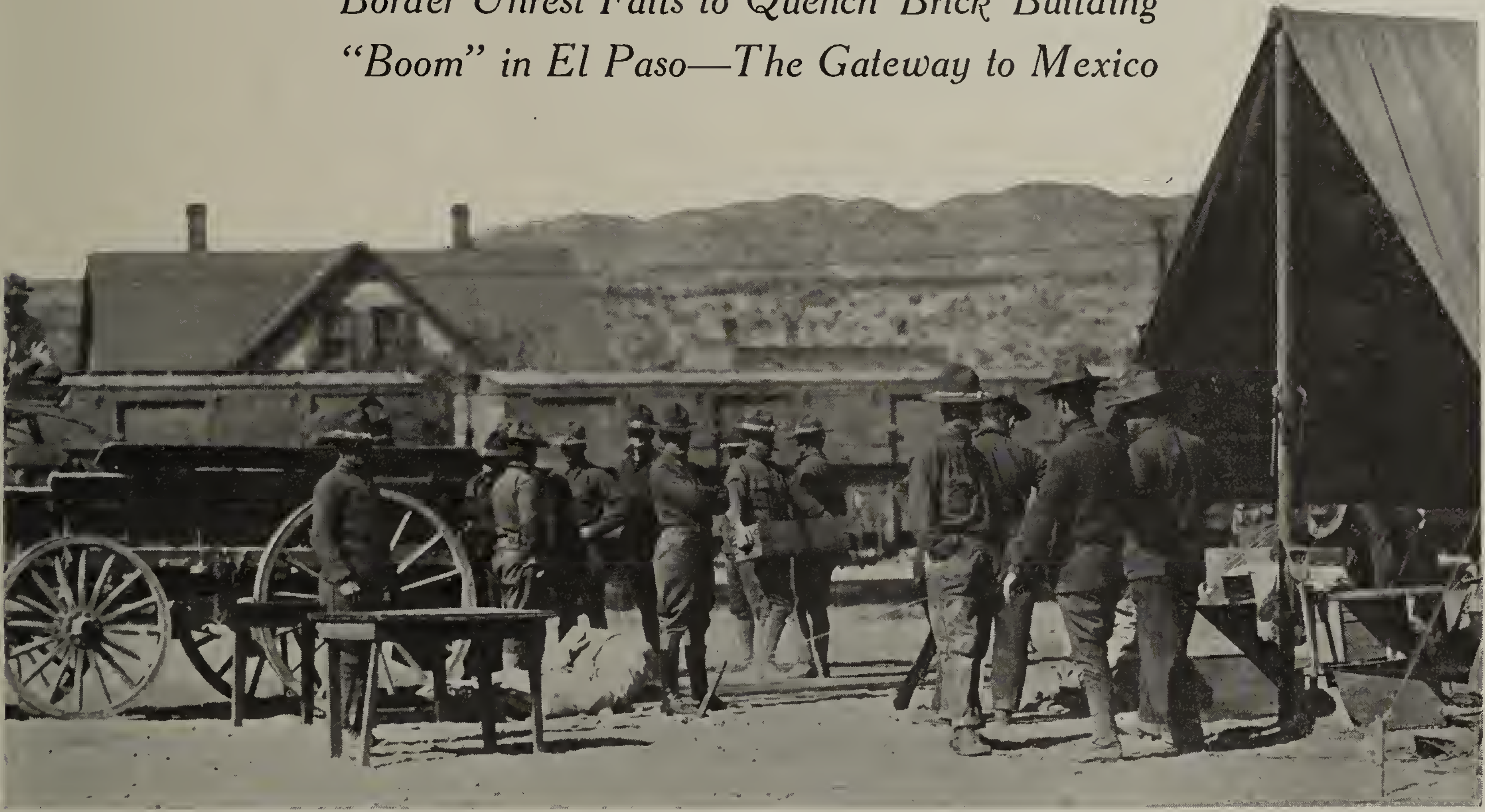


Photo by International Film Service, Inc.

WHILE THE EYES of the nation are being centered upon the Mexican border which, in a few days, has become the scene of hurried military preparations for the punitive expedition which has for its objective, the capture of Villa, very few realize that El Paso, Tex.—until within scarcely a week the base of army operations—has been doing some remarkable things in which the manufacturer of building brick might be interested.

All during the past year, while General Funston has been trying to guard the border with a mere handful of men against the raids of Mexican bandits, building and the use of brick in that city have been expanding at an unprecedented rate. Some idea of the magnitude of operations during 1915 may be gained when it is learned that $3,600,000 in value of permits were issued—very close to one hundred per cent more than the previous year—breaking all previous records and giving the first rank to this city among the cities of Texas in the amount of building projected. Furthermore, it is stated upon reliable authority that brick is being used in nearly ninety per cent of the operations.

The city is located in El Paso county, Texas, and is situated on the east bank of the Rio Grande River, two hundred and fifty miles south of Santa Fe, New Mexico, on the Southern Pacific Railway. The river at this point is spanned by a bridge connecting El Paso with Juarez, formerly called El Paso del Norte, a city in the state of Chihuahua, Mexico. El Paso is a port of entry and considerable quantities of various commodities pass thru its customs house from Mexico.

The location of the city, from whence trade can be carried on with a large territory in northern Mexico, has been one of its greatest advantages. Indeed, it is believed by local manufacturers of clay products and those interested in their distribution that, with the opening up of Mexico, El Paso will become an important gateway to the republic which will bring thousands of people to that point. This will mean that the amount of building done during the next year or so will approach nearer to the five million dollar mark.

It is hardly likely that present conditions will continue to exist in Mexico for a very much longer time and, altho the past five years have seen little but bloodshed and strife, the patience of the American people has about reached its limit. It is believed that it is only a question of a short time before the situation in Mexico will have been adjusted. The future in El Paso, so far as the manufacturers and dealers in burned clay building materials are concerned, looks very bright.

However, what is being accomplished at the present time in the way of brick building is perhaps of more interest to the majority of readers than is the future.

There are many excellent examples of building in El Paso which are a credit to brick. From low-cost bungalows to the palatial Paso del Norte Hotel, brick is almost the sole material used. In the accompanying illustration the home of a prominent local architect is shown, and it is with the utmost significance that brick has been chosen to carry out the design of this very beautiful structure. There is now in the course of construction in this city a county courthouse which will cost about $600,000 and a new high school whose value will reach $500,000, both of which will be built with brick.

The Home of an El Paso Architect Who Chose Brick as the Best Means of Expression for His Ideas in Home Building

As has already been mentioned the building figures for 1915 established a new record. The next best showing was made in 1912, when permits were issued for $2,217,828. The increase in 1915 over that figure was $1,385,839. In 1914, the business amounted to $1,924,287, or $1,679,380 under the past year.

Besides being the greatest year, insofar as the matter of large construction is concerned, 1915 has seen more home building than ever before in this city. Much of the latter class of work has been in new subdivisions located just outside of the city limits, so that the figures given above do not represent by many thousands of dollars, the actual construction work of the municipality.

It is interesting to note that the great unrest that prevails just across the border has had little or no effect upon a healthy expansion in the city that is located just opposite what the Mexicans term "The Pass to the North."

Blowing Hot and Cold

The Moores-Coney Company, of Cincinnati, Ohio, advertises a reduction in the price of hollow-brick, and tells that they are delivered from the factory direct to the job. A feature is made of the fact that "No Middleman Is Involved." Emphasis is also laid on the fact that "You Pay for the Brick—That's All." The Builder is asked to "See Us for Special Discount."

F. Lawson Moores, of the Moores-Coney Company, was president of the Face Brick Dealers' Association of America for the first two years of its existence. He was relieved of his position at the convention recently held at Old Point Comfort. Face-brick dealers are distinctly "middle-men." In buying from them the builder does pay for something beside the brick—he buys intelligent selection and service, made possible by experience.

If the Moores-Coney Company still sells face-brick manufactured at some plant which it does not own, it is a middle-man in the sense of its own advertising. Do builders who buy face-brick from it "pay for the brick—that's all?"

New York Offers Ceramic Short Course

An opportunity to hear a number of noted authorities on subjects of clayworking and ceramics, and to gain a large amount of practical knowledge, will be given, not only the citizens of the Empire State, but all who care to attend the short course to be held at the New York State School of Clayworking and Ceramics, Alfred, N. Y., April 17 to 20.

A course of lectures has been arranged which is designed to meet the needs of men who are actually engaged in the business of turning raw clay into superior building materials and pottery. No fees will be charged for the course and a common school education is all that is required in the way of preparation.

That the course will be well worth while, is indicated by the type of men who grace its program, among these being Prof. A. V. Bleininger, of the United States Bureau of Standards, Prof. Heinrich Ries of Cornell University, Prof. Chas. F. Binns, director, Prof. E. T. Montgomery, Prof. W. A. Titsworth and C. H. Milligan, of the New York State School of Clayworking and Ceramics; also F. T. Owns of Ridgway, Pa., and Harold Copping of Philadelphia, Pa., who have had years of experience on the plant.

Those wishing to attend this course are urged to write at once to Prof. Binns, stating the days on which they expect to be present. Housing accommodations can be secured near the University at reasonable rates, and information relative thereto can be had by registering at the Director's office. Reservations will be made for those writing in advance, if so desired.

Canadians Discuss Brick Tariff Adjustment

A discussion on the existing tariff on brick imported into Canada from the United States was the sole topic at the evening session of the first day of the Western Ontario Clay Workers' Association Convention held at London, Ont., February 23 and 24. As a result of the speeches made on this subject a committee of two was appointed, including D. Wigle and R. Whelan, to investigate border conditions with a view to readjusting the tariff on brick and taking the matter up with the local members of Parliament. It was suggested that the tariff be adjusted either by raising the fixed valuation or else by removing it entirely and charging the present rate of 22½ per cent plus a 7 per cent war tax on the actual purchase price of each consignment.

The principal speaker at the opening session of the convention was Charles Miller of Toronto, an inspector connected with the provincial Workmen's Compensation Board, who explained the workmen's compensation act in so far as it affected the owners of clay plants.

The following officers were elected for the coming year: Walter Clark, of Sarnia, president; J. W. Crawse, of London, first vice-president; C. S. Parker, of London, second vice-president, and Alfred Wehlan, of Cairo, secretary and treasurer.

CERAMISTS *extend* "HELPING HAND"

Co-operation is Keynote of Discussions and "Section Q" at Inspiring Sessions of the American Ceramic Society

EMINENTLY SUCCESSFUL hardly fits the description of the eighteenth annual meeting of the American Ceramic Society held at Cleveland, Ohio, February 21 to 24. With an attendance of one hundred and fifty—the highest ever attained at any of the society's gatherings—and with an interest that was inspiring, to say the least, this convention passes into the records as one long to be remembered.

The spirit displayed by the members attending the Cleveland meeting was that which characterizes the sessions of any high-grade technical association. In many ways it was apparent that the members realized the papers were very well worth hearing. While the attendance at each of the seven long and rather tedious sessions was large, the order was excellent and the discussions earnest and thoro. Even a casual observer would have been impressed with the fact that the men presenting the papers and taking part in the discussions, were making a real effort to give information that would be of service to their fellow members.

The program of this meeting was of special interest to the manufacturers of the cruder clay products, such as brick, hollow-tile, drain-tile and sewer-pipe. Of course, all sorts of ceramic subjects were discussed, but fully one-third of the papers read dealt with the clays used, or the methods followed in the manufacture and testing of crude clay products.

In general, the papers read before the American Ceramic Society are somewhat more scholarly and perhaps more carefully prepared than those presented at most conventions where manufacturers of brick and other burned clay building materials gather to discuss their problems. While the ceramic papers contain more theory, they are not necessarily less practical. All good practice must be founded upon good theory, whether the man who develops the practice recognizes the underlying theory or not. The very fact that some of the papers read at the meeting of the ceramic society are theoretical, makes them a valuable addition to clayworking literature. They supplement very nicely the entirely practical papers presented at other conventions.

In looking over the list of those who had a part in the program, it was gratifying to see the young graduates coming forth with papers, based not only upon their university experience, but also upon practical work.

"The one thing that made the greatest impression upon me," said a prominent member of the society, "was the enamel iron manufacturers. They held a half-day session where from twenty to two dozen men, sitting around a table, earnestly discussed each other's problems, although many of them were competitors. It is to be hoped that this will be a permanent feature of the ceramic society meetings and that the other industries will follow suit. If we could have one afternoon devoted entirely to a round table for the potters and another for brick manufacturers, discussing technical problems, our annual meeting would be greatly enhanced in value."

It would be much too large and uninteresting a task to attempt to list the fifty-one papers that were read and make any comment upon them. Suffice it to say that there were all very good and covered a wide range of subjects. All will appear in the printed transactions of the society of which Arthur S. Watts is the editor for 1916, and some of these in the columns of this magazine from time to time, as seems advisable. Perhaps, one of the noteworthy features of the first day's sessions was an address by Myron T. Herrick, former United States Ambassador to France.

During the convention, application was made for charters covering the organization of the Iowa State College Branch of the American Ceramic Society, also the University of Illinois Student Branch of the society. Both of these requests were granted and charters issued, the new organizations to be installed sometime during the present year by President L. E. Barringer.

NEW ASSOCIATE MEMBERS ELECTED

The following were elected to associate membership; C. F. Carman, president National Silica Works, Berkeley Springs, W. Va.; R. W. Greene, general manager, Kentucky Construction and Imp. Company, Mayfield, Ky.; H. W. Holmes, general manager Puritan Brick Company, Detroit, Mich.; W. M. Jacobs, ceramic engineer, Pittsburgh Plate Glass Company, Creighton, Pa.; R. W. Jones, economic geologist, New York State Museum, Albany, N. Y.; C. S. Kinnison, ceramic engineer, Pittsburgh, Pa.; T. A. Klinefelter, ceramic engineer, Westinghouse Electric Company, Derry, Pa.; A. Malinovszky, chemical engineer, Lincoln, Ill.; R. M. Balmert, New Jersey Terra Cotta Company, Perth Amboy, N. J.; M. T. Cole, Logan Clay Products Company, Logan, Ohio; G. P. Gavin, Monument Pottery Company, Trenton, N. J.; Seiji Kondon, Higher Technologic School of Tokio, Tokio, Japan; Otogoro Umeda, engineer Shinagawa Fire Brick Company, Tokio, Japan; R. H. Lardin, assistant chemist, Pittsburgh Plate Glass Company, Creighton, Pa.; R. H. Pass, chemist, Onondaga Pottery Company, Syracuse, N. Y.; H. T. Reeve, chief scientist, American Optical Company, Southbridge, Mass.; E. M. Tilton, assistant testing engineer, Ohio State Highway Department, Columbus, Ohio; R. E. Anderson, student, Ohio State University, Worcester, Mass.; J. Bailey, ceramist, Corning Glass Works, Corning, N. Y.; J. B. Blewett, student, Ohio State University, Lead, S. D.; H. C. Ginn, Elk Fire Brick Company, St. Marys, Pa.; P. G. Larkin, Denver Terra Cotta Company, Denver, Colo.; J. A. Martz, student, Ohio State University, Columbus, Ohio; L. R. Office, student, Ohio State University, Columbus, Ohio; J. D. Ramsay, president, Elk Fire Brick Company, St. Marys, Pa.; H. E. Clark, student, University of Illinois, Champaign, Ill.; J. Darling, superintendent, John Douglas Sons Company, Cincinnati, Ohio; R. W. Taylor, chemist, Canton Stamping and Enameling Company, Canton, Ohio; R. L. Clare, Federal Terra Cotta Company, Woodbridge, N. J.; C. H. Umckenhirn, Standard Sanitary Manufacturing Company, Pittsburgh, Pa.; H. F. Crew, student, Ohio State University, Columbus, Ohio; F. H. Chapin, Hydraulic-Press Brick Company, Cleveland, Ohio; W. E. Segsworth, mining engineer, Toronto, Canada; F. B. Dunn, Dunn Wire-Cut-Lug-Brick Company, Conneaut, Ohio; Oliver O. Bowman, Trenton Fireclay and Porcelain Company, Trenton, N. J.; W. Kress Crouin, student, Ohio State University, East Liverpool, Ohio; Edward A. Brockman, salesman, Roessler & Hasslacher Chemical Company, Chicago, Ill.; Herbert S. McMillan, Porcelain Enameling & Manufacturing Company, Beaver Falls, Pa.; E. W. Knapp, Sun Brick Company, Ltd., Toronto, Canada; R. H. White, The Norton Company, Worcester, Mass.; H. G. Keese, student, University of Illinois, Litchfield, Ill.; Thomas S. Browning, student, University of Illinois, Champaign, Ill.; J. W. Wright, student, University of Illinois, Champaign, Ill.; C. E. Bates, student, University of Illinois, Galesburg, Ill.; J. L. Crawford, student, University of Illinois, Macomb, Ill., and E. H. Weil, manager, Enamel Products Company, Cleveland, Ohio.

Auto Club Officials Address Paving Brick Men

At the informal reception held during convention week at Cleveland by the National Paving Brick Manufacturers' Association on Tuesday evening, Feb. 22, the principal speakers were the Honorable Richard H. Lee, president, and Fred Caley, secretary, of the Cleveland Automobile Club.

Interspersed with some very excellent music, these men told of their experiences while traveling over many of the roads in various states and pointed out how much better road conditions were in Ohio because of the prevalence of brick pavements.

Mr. Caley's story of his early life in which he told of living on a farm in northern Ohio, that was isolated from the rest of the civilized world six months of the year because of bad roads, was particularly interesting. However, since leaving the farm, a brick road has been built which passes the old homestead, and it has only been recently that he has attempted to buy back the place for sentimental reasons, but has found that its value has increased many times the original price, due to the influence of a passable and permanent highway.

At the close of the reception, a road map was given each guest. The company disbanded to meet again in the booth of the National Paving Brick Manufacturers' Association at the Complete Building Show, where an appropriate souvenir was given the ladies.

"Boom" Follows Complete Building Show

Probably the biggest building "boom" the country has ever seen is about to take place in Cleveland, Ohio, as the sequence of the Complete Building Show held in that city February 16 to 26. Brickmakers, who are in a position to know, state that the rising tide of activity has already set in.

Most of this building will take the form of residence construction to provide for the increasing population of the city and a growth in the number of home builders. While there is a good deal of wooden construction in the Sixth City, so far as housing is concerned, there is no doubt that this proportion will soon give way to fireproof buildings, due to the activities of local associations, prominent among these being the S. A. F. E.

While it is yet too early to obtain figures showing just what influence the Complete Building Show has had upon the community, information coming into the office of the general secretary, Ralph P. Stoddard, shows that at least ninety per cent of the city's architects visited the show. These architects report that they are receiving orders for a large number of plans, one man in particular having secured no less than five new clients as a result of the show.

Probably the greatest influence upon building has come from the exhibition of low-priced homes. Many people were surprised to learn that permanent materials, including those of burned clay, are within the reach of the average individual.

THE BOOKLET *for which* YOU *have been* WAITING

TILE YOUR FARM
for Bigger and Better Crops
No investment pays so well so surely and so soon as—the amount spent in the purchase and placing of: WELL BURNED CLAY DRAIN TILE

According to reports that are coming from many sections of the country, it looks very much as tho nineteen-sixteen will be a busy year for drain-tile manufacturers. It is entirely superfluous to repeat the reasons for this condition existing. It has been the same story over again. When it rains, the farmer realizes he needs more tile and, like many other classes of citizens, he waits until something happens before taking preventative measures.

The unprecedented wetness of the past summer caught the vast majority of farmers totally unprepared, so far as adequate drainage is concerned, and now they are making hasty plans to tile their farms to prevent any further crop losses.

But next year may be a dry year, and all that has been done for drainage by the dampness of nineteen-fifteen, may be undone by two or three years of normal rainfall.

Now—when the farmer has his attention focused on his drainage problems—is the time to drive home the fact that he should completely tile his farm—and do it with burned clay drain-tile.

Now—when he is looking over those muddy fields and wishing he could get out there and do some plowing—is the time to tell him how adequate drainage will advance his growing season at least two weeks by reason of drier and better soil conditions.

As a companion to the silo booklet, the drain-tile booklet shown in the accompanying illustration, is offered by this magazine to be your messenger, telling the farmer why he should tile his farm *now*. It is an effective piece of advertising literature that will fit in your large-size letter envelopes.

It can be obtained for the same prices as the silo booklet and by addressing: *Brick and Clay Record's Book Department*. In lots of one thousand—$30; 500—$15; 300—$12; 200—$9 and 100—$5. Send for a sample copy.

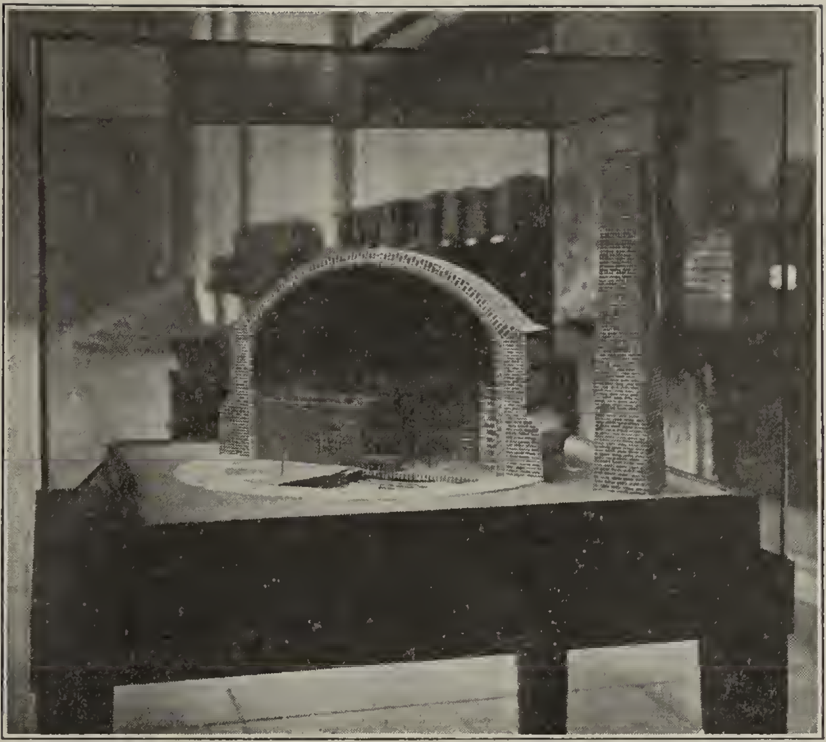
BRICK YARD MODEL *finds place in* MUSEUM

Empire State Makes Educational Curio of Hudson River Brick Plant and Round Down-Draft Kiln

THE STATE of New York has decided that there is enough human interest in a brick yard to warrant its being reproduced in a miniature plaster model, and enclosed in a glass case. And, since it has found this interest in a brick yard, what is more natural than finding a similar interest in the heart of a yard—that is, in the kiln?

In the New York State Museum, which is located in the Education Building in the city of Albany, there are, at the present time, two models, illustrations of which are shown on this page. They are furnished thru the courtesy of Robert W. Jones, assistant in Economic Geology, connected which the office of the New York State Geologist. These two are the beginning of a collection of models that will, in time, be well worth studying.

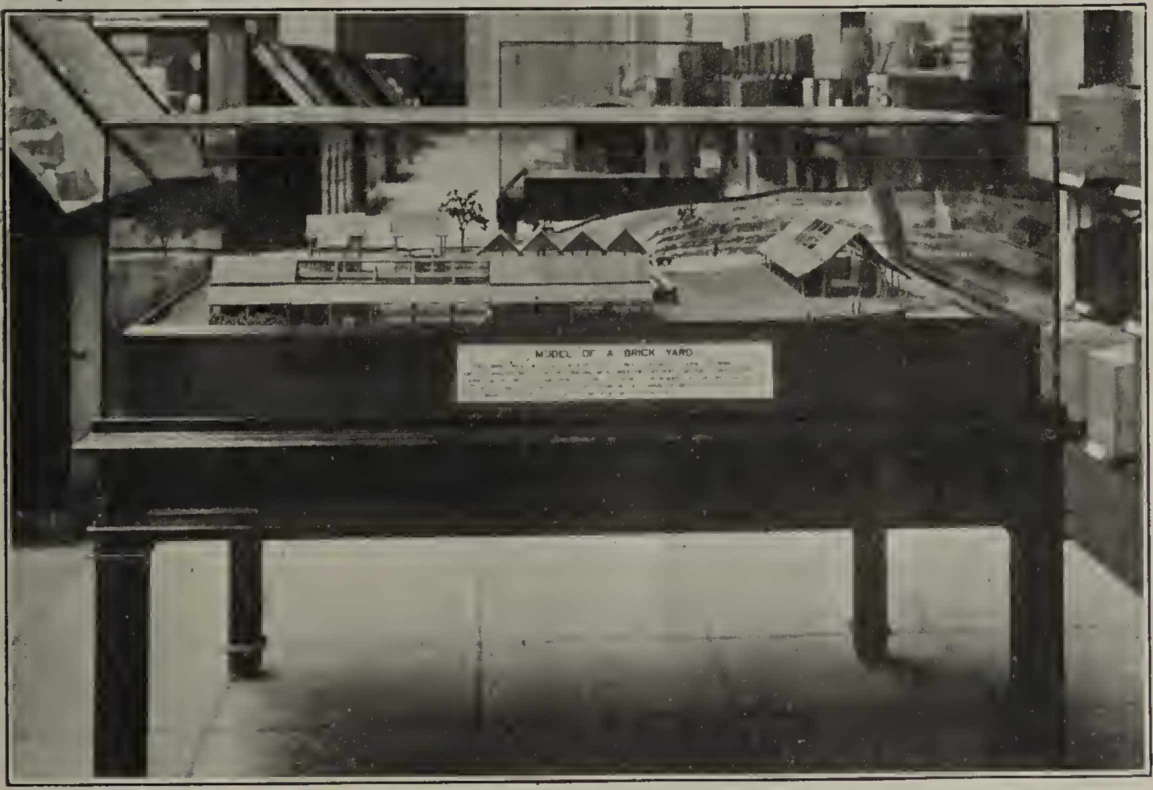
The larger illustration shows the complete brick plant. This model is constructed on a scale of eight feet to the inch, and shows two methods of mining clay, two methods of tempering, two methods of drying, and two methods of kiln construction and burning. The two methods of mining are bench mining, such as practiced mainly in the Hudson valley and pit mining with caving such as in use among the Long Island and Staten Island yards.



A Plaster-of-Paris Model of a Down-draft Kiln, Such as is Used in New York State for Burning Drain-tile and Common Hollow-brick

The methods of tempering are those used in different sections of the Hudson valley and consists of the circular pit now used almost entirely at the Kingston yards and the rectangular soak or sod pit. This also shows the different methods of feeding the tempered clay to the machine by shoveling and by the use of a chain-drag elevator.

Drying is shown in the pallet and open yard. Under the two kiln sheds are shown the ordinary scove kiln and the semi-permanent scove kiln with permanent side walls such as are used in the Staten Island yards. The scove kiln shows one kiln ready to be fired with wood and another kiln partly set. The semi-permanent kiln shed shows one kiln ready to be fired with coal and one partly set.



A Miniature Hudson River Brick Yard in a Glass Case

The smaller illustration is that of a down-draft kiln. The model is constructed of plaster from measurements taken from the kilns of this type that are used in New York state for burning drain-tile and common hollow-brick. The model is cut along the diameter in order to show both the inside and outside construction. The outside shows the grates and arrangement of the bands. The inside is divided into quadrants—the first showing the foundation, main and side flues exposed, the second showing the fire-brick floor with foundations for fire-places; the third, the bare floor with the flues from fire-places, and the fourth, partially filled with set bricks. Arrows show the direction of draft.

Altogether the present showing, tho confined to but two models, is one that offers a worthy example to the public officials of other states.

When You Want a Suit of Clothes You Don't Go to a Blacksmith.

No more should you seek assistance in the conduct of your business from those who are not able to help you. If you want to buy a brick plant, hire a salesman, superintendent or burner, sell excess equipment or do a hundred and one other things that come up in the day's work.

Watch the Classified Ad Department. It Can Help You. In This Issue on Page 598.

TREATING THE CLAY COLUMN
to improve the color of
DARK FLASHED FACE BRICK

In Which Are Shown the Results of Some Experiments Conducted on Illinois Brick Plants

By Arthur B. Williams, B.Sc.*
Instructor in Ceramics, University of Illinois

THE PRODUCTION of black and dark brown brick has come to be an important consideration to the face brick manufacturers. Many red-burning clays and shales are in use which will not withstand the severe reducing conditions and high temperatures necessary to produce these desired colors, or will not flash as easily as others because of differences in their physical and chemical composition. In the following work, experiments have been made in an attempt to develop an inexpensive method of producing these desired colors on such clays and shales.

The best method which suggested itself was to treat the surface of the column, as it issued from the die, with solutions containing salts of common metals.

SOLUTION USED IN EXPERIMENT I.

(a) Approximately 0.7 normal solution ferric chloride ($FeCl_3$) analyzing 113 grams Fe_2O_3 per liter.

(b) Approximately normal solution ferrous sulphate, using 300 grams $FeSO_4$ per liter and testing about 156 grams Fe_2O_3 per liter.

These solutions were sprayed on a column of clay as it issued from the die, using a clay which burned to a fair red color, but did not flash very dark at ordinary kiln temperatures.

Samples having both the smooth and rough or mat surface were cut from the treated column. Dry brick from two factories in Illinois were also sprayed with these solutions. These brick were all placed in a steam dryer for two days, and then burned in an open-fire down-draft test kiln. Samples were drawn from the kiln as follows:

1. Drawn at 1,100 deg. C., with kiln conditions oxidizing.
2. Drawn at 1,150 deg. C., two hours later, burning with gas conditions alternately oxidizing and reducing.
3. Drawn at 1,200 deg. C., two hours after drawing second trial and burning with gas conditions reducing.

Samples Not Treated	1st Set	Clay Treated Wet	Clay Treated Dry
Pale red. Signs of scumming.	$FeSO_4$	Pale red as clays not treated.	Pale red as clays not treated.
	$FeCl_3$	Darker red — no scum.	Pale red as clays not treated.
	2nd Set		
All scummed and have dirty gray color. Flashing not effective.	$FeSO_4$	Grayish brown; better than sample; not treated.	Same as sample, not treated.
	$FeCl_3$	Chocolate brown, good color.	Same as sample, not treated.
	3rd Set		
Flashed shiny black.	$FeSO_4$	Flashed shiny black.	Flashed shiny black.
	$FeCl_3$	Flashed shiny black.	Flashed shiny black.

The accompanying table shows the results obtained.

These results lead to the following conclusions:

1. Treating dried brick with ferrous sulphate or ferric chloride gave no satisfactory results.
2. Treating the clay column while still wet, showed an improvement in the color, principally by giving a surface free from whitewash.
3. Ferric chloride was much more effective than the ferrous sulphate.
4. A slight amount of flashing gave brick a darker color when treated with $FeCl_3$.

RESULTS OBTAINED FROM EXPERIMENT II.

As a continuation of these experiments, another set of samples was made using the same clay which was treated in the stiff-mud condition in the first experiment and two other clays which were known to scum and give a generally poor color when not treated with barium compounds.

Five sets of trials were made from each clay, as follows:

1. Rough and smooth faces not treated.
2. Rough and smooth faces treated with ferrous sulphate.
3. Rough and smooth faces treated with ferrous sulphate, then with ammonia to precipitate ferric hydroxide.
4. Rough and smooth faces treated with ferric chloride.
5. Rough and smooth faces treated with ferric chloride, then with ammonia as in set No. 3.

These bricketts were placed in saggers, covered well to prevent any flashing effect of the open fire, and burned to 1,150 deg. C. in 36 hours. The results are shown in Table I on the opposite page.

This experiment confirmed the conclusion from experiment I, that ferric chloride was actually overcoming the effects of scumming.

CHEMICAL COMPOUNDS VOLATILIZED IN THE KILN

The effect of volatilizing ferric chloride in a kiln was also tried, in experiment three. The test kiln was set with half-brick and burnt to 1,000 deg. C. in 48 hours. One-half pound of ferric chloride was then put in each

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*Reprinted from the Transactions of the American Ceramic Society by Special Permission.

of the two fire boxes, the damper closed until the fumes were coming very slightly out of the fire boxes, and the kiln kept in that condition for one-half hour. The kiln was then fired in the regular manner, and samples drawn one-half hour later. This treatment seemed to have had no appreciable effect on the color.

The temperature of the kiln was then raised to 1,100 deg. C. and ferric chloride used in the same manner as before, but with the same results.

Finally, the kiln was finished at 1,150 deg. C., at which time a third treatment of ferric chloride was given, after which, firing was discontinued, and the kiln cooled in the regular way. When the kiln was opened everything was flashed to a dark brown color, but whether or not the high temperature and somewhat reducing condition was as much the cause of the color as the ferric chloride in an unsettled question.

The results at this time indicated that ferric chloride was assisting the flashing somewhat, but more especially was producing good clean red colors, free from scumming. Comparing the cost of ferric chloride with the cost of barium compounds and also the relative quantities used, the cost of using ferric chloride would be considerably cheaper, costing about two cents per thousand brick. The balance of the experimental work was therefore done on a commercial scale at three different factories where a considerable amount of barium is now being used. The results in detail are given below.

The method of spraying the column of brick on a commercial scale was tried, but gave considerable trouble, and the simple but effective method of using a roller 3 inches or 4 inches in diameter and covered with lamb's wool, placed in front of the die was adopted. The ferric chloride solution was allowed to drop from glass stop-cocks onto the roller.

At one factory, about six thousand brick were made with a solution of one-half pound commercial ferric chloride per gallon of water, which was applied to the column at the rate of one gallon per six thousand brick.

At another factory, three trials were made, using one, one and a half, and two pounds of commercial ferric chloride per gallon of water and spreading the solution on at the rate of one gallon per three thousand brick. All of these trials resulted in a failure so far as removing the scum was concerned, altho the last trial using two pounds per gallon of solution produced an appearance on the brick similar to that found when barium compounds had been added in an amount not quite sufficient to completely remove all of the scum, forming a rather pimpled effect with the under color good. It is intended that further practical tests of this sort will be made in an effort to overcome scumming.

REASON NOT KNOWN FOR SCUMMING REDUCTION

The reason for the effects of ferric chloride in reducing the scumming are not as yet clear. Fe_2Cl_6, H_2O, either alone or mixed with powdered gypsum gives up a large quantity of HCl below 200 deg. C., and the last traces are driven off below 250 deg. C. There is no evidence of SO_2 being present in the gases expelled from the mixture of ferric chloride and gypsum, and therefore no indication of the decomposition of the sulphate.

The fact that the trials treated with ferric chloride and ammonia showed as good a color as the trials treated with ferric chloride alone would lead one to believe that the improvement is not due to the free HCl evolved.

It is shown by H. O. Hofman and W. Mostowitsch* that the presence of SiO_2 or Fe_2O_3 lowers the dissociation temperature of $CaSO_4$. In heating with SiO_2, decomposition was first indicated by the evolution of SO_2 at 1,000 deg. C.; with Fe_2O_3, dissociation of the sulphate was first indicated by the evolution of both SO_2 and O at 1,100 deg. C.

This may explain why such results are obtained in a test of kiln, using temperatures above 1,100 deg. C., and not in a commercial kiln using temperatures between 1,000 deg. and 1,050 deg. C. The sulphates coming to the surface in the process of drying brick would, no doubt, become more or less mixed with the ferric oxide present, and this condition would compare favorably with the experiments of Hofman and Mostowitsch. On the other hand, the entire effect may be simply one of covering the scumming.

Table No. 1

Set No. 1	Set No. 2	Set No. 3	Set No. 4	Set No. 5
Rough and smooth faced samples showed scummed surfaces with grayish color.	Rough faced samples appeared considerably better than untreated samples but did not give a clean red color. Smooth faced samples not much improved.	Same as No. 2.	Rough faced samples showed good clean bright red. Smooth faced samples greatly improved.	Rough and smooth faced samples showed good clean red color, except where there was slight flashing.

Further experiments in producing dark colors were made in commercial kilns by the introduction of manganese chloride and copper chloride into the kiln at the completion of the burn.

The burns, in which these salts were introduced, were carried on under oxidizing conditions, and the resulting colors would ordinarily have been light chocolate on the brick in the top ten courses and a red color on the lower part of the kiln. At the finish of a burn, after the fires had become free from flame, twenty-five pounds of manganese chloride was put into the top hole of the kiln crown, and the damper of the kiln nearly closed. There was evidence of fumes going thru the kiln over a period of about five minutes. The damper was left closed for one-half hour, however, and the kiln finished in the regular manner. The brick in this kiln were well blacked in the form of an inverted cone, from the top about half-way down. In all probability, if this kiln had been flashed for black brick an even larger number would have shown the effects of the manganese. However, this gives a method of blackening ware without flashing it to a very great extent and risking the results of over-burned brick.

The price of manganese chloride at the time these experiments were made was about six cents per pound, but since them it has been advanced very considerably in price.

Treating a kiln with copper chloride in the same manner as above gave no marked effect. If anything, only a slight tendency to give a brown color might be attributed to it.

The volatilization of ferric chloride in commercial kilns has not yet been tried. It is possible, that this salt will assist in giving a black color.

SUMMARY

1. Treating the surface of a stiff-mud clay column with ferrous sulphate did not markedly affect the color in burning.

2. Treating the surface of a stiff-mud clay column with ferric chloride did improve the color, evidently by removing the scumming, but as yet no good results in commercial kilns have been obtained.

3. Manganese chloride, volatilized in brick kilns at the finish of a burn, produced dull black colors with but little previous flashing of the kiln.

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*The Behavior of Calcium Sulphate at Elevated Temperatures with Some Fluxes. Transactions Inst. of Mining Eng., Vol. 39, page 628.

4. Copper chloride gave very little evidence of darkening the color of the brick.

In conclusion the writer desires to acknowledge his indebtedness to his co-worker of the Department of Ceramic Engineering, University of Illinois.

Drainage "Boosters" Show Great Enthusiasm

The Iowa State Drainage Association is alive.

This fact was very much in evidence at the annual meeting held at Fort Dodge, Iowa, February 24 and 25. About one hundred members were in attendance, to which may be added at least fifty visitors, bringing the total up to one-hundred-and-fifty. Practically every one of the one hundred members present was an expert in some phase of drainage, coming from representative localities in Iowa. At least half of those who attended, were engineers. The remainder was made up of contractors, manufacturers, farmers and county auditors.

Everyone seemed to be a "booster" for drainage and there was considerable rivalry in enthusiasm, but none in spirit. It would have been difficult to find a more harmonious gathering of experts with as diverse interests as were represented.

Dean Marston, Director of the Engineering Experiment Station of the Iowa State College at Ames, Iowa, presented the report of the Committee on Standard Specifications for Drain-tile and Sewer-pipe. Dean Marston has been chairman of this committee for several years and as such, has rendered very valuable service to the citizens of the state. Thru his connection with the Engineering Experiment Station at Ames, and his work on Committee C-6 of the American Society for Testing Materials, he has been able to direct investigation in an economical and comprehensive manner. The association appreciates the services which he has rendered in this way. His close co-operation has enabled its members to receive the fullest benefit from results secured thru his investigations and tests.

W. J. Schlick, drainage engineer of the Engineering Experiment Station, Iowa State College, gave the results of recent tests on the "Influence of the Method of Bedding Upon Strength of Drain-tile." This important work is being investigated from every viewpoint. The manufacturers of both drain-tile and sewer-pipe have expressed their confidence in the earnestness of the experiment station and are co-operating heartily with them in furnishing material for tests and otherwise offering their assistance.

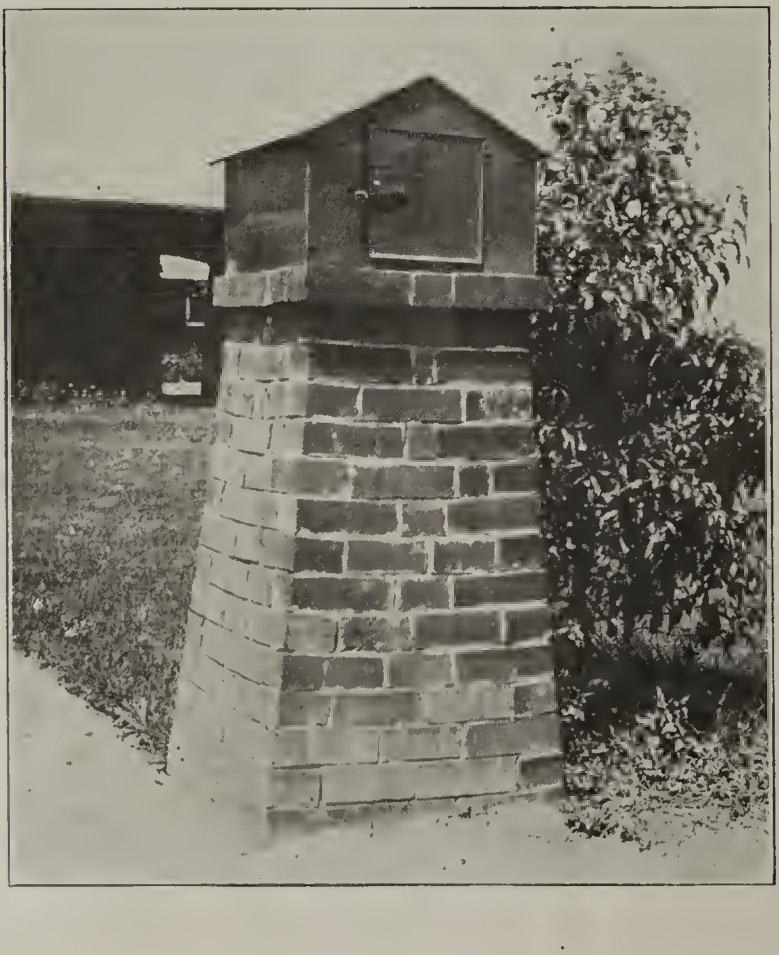
H. McCrory, Chief of Drainage Investigation, Office of Public Roads and Rural Engineering, Washington, D. C., gave a comprehensive lecture on "Run Off Problems in Drainage Work." A talk on "The Misuse of Drainage Systems as Sanitary Sewers," by Lafayette Higgins, Sanitary Engineer of State Board of Health, brought out a very interesting general discussion of this problem. Professor John T. Stewart, of the University of St. Paul, presented a very interesting paper on "Proposed General Specifications for Public Work." Professor Stewart brought out many important points on this subject which were discussed freely by the members.

The officers elected for the ensuing year were: John W. Boyer, president, Fort Dodge; John T. Brug, vice-president, Stratford, and M. F. P. Costelloe, secretary, Ames.

Kentucky Plans Many New Brick Pavements

Vitrified brick streets and roads are receiving considerable consideration in Kentucky. Three contracts—a part of Louisville's 1916 paving program—have been awarded by the board of public works, the total figure being $20,000. Other vitrified brick paving will be laid by the city later in the year. Out in the state there is much discussion of proposed brick paving. Maysville will spend $100,000 for this work in the near future. The sentiment there is strong for brick. Brick streets in that city have given excellent satisfaction, according to reports of experts. The first Maysville street so paved was laid ten years ago and, it is stated, there is no sign of failure. Barbourville is another of the smaller towns that is giving brick favorable consideration.

PUTTING BEAUTY *and* PERMANENCE *into the* MAIL BOX



To anyone who has journeyed along a country road, the tin-box-on-a-stick receptacle for mail is a familiar sight. To say the least, this fixture adds very little to the beauty of the landscape.

As a substitute for these careless-looking boxes, the one shown in the accompanying illustration is offered, which has the merit of both permanence and an attractive appearance. It is built with brick which form a very substantial support for a good-looking copper box.

The whole affair can be made to harmonize very well with the house, if the same color and texture of brick are used. In the case of the house opposite which the box in the accompanying illustration stands, this has been done. The brick, which are smooth and red in color, are laid up with a light-colored mortar. The pedestal upon which the box stands is about two feet in diameter at the base, tapering gradually toward the top, at which point it has a thickness of about eighteen inches. A cap, in the form of a slab one brick in thickness, tops off the pedestal, which is 3½ feet high. A mail box such as this can be constructed for very little money and will last a lifetime.

BUILDING *a* POTTERS' DOWN DRAFT KILN *with a* CENTER STACK

With Comparative Figures on Life and Economy of Operation as Contrasted to Kilns of Up-Draft Type

By E. T. Montgomery, E. M. (In Cer.)
Professor of Ceramic Engineering, Alfred, N. Y.

THIS PAPER was originally presented before the American Ceramic Society and forms a part of its copyrighted "Transactions." It is reprinted by permission and in response to numerous requests for information on the construction of kilns of this type. The drawings and other necessary data were furnished by Professor Montgomery and revisional notes made by him especially for this publication.

(*Continued from March 7 issue.*)

WHEN No. 1 is finished and the fires are started on No. 2, it would in turn discharge its heat into No. 3 and so on around the circle, thus saving a great deal of the heat carried out in the waste gases where each kiln is fired separately.

In closing, I wish to say that I trust this paper may serve the good purpose of bringing into our trade journals and into the "Transactions" of our ceramic societies and associations, the exact descriptions of many other types of kilns of good construction and of proven worth, which are in daily use in the many different branches of the industry.

NOTES ON THE FUEL CONSUMPTION OF SOME WHITEWARE KILNS, BY THOS. GRAY, E. BOSTON, MASS.*

A description is given by Mr. E. Montgomery in the Transactions of the American Ceramic Society, Volume XIII, page 311, of a very economic kiln, downdraft, with an inside stack. Below is given in tabular form a description of four kilns in use at the plant of the New England Pottery Co. For the purpose of comparison, there is also given a description of Montgomery's kiln.

In giving the number of bungs, Mr. Montgomery does not mention the size of his saggers. In case of the New England Pottery Co.'s kilns, the number of saggers mentioned include common, oval, coffin, single and double plate, cuspidors, etc.

As Mr. Montgomery invites comparison, I would call attention to my experience in regard to the economy of kilns. Kilns No. 1 and No. 2 were built in 1856 by Nutt, of Trenton; No. 4 about 1867; and No. 3 in 1903, by Louis Nutt, of Trenton. My personal knowledge goes back forty years. In that time No. 1 and No. 2 have been in constant use except for seven months, and No. 4 has been idle for about ten years. Kiln No. 3 is economic in firing, but has been an unlucky kiln, and we do not use it more often than necessity calls for. During 1897, all three of the stacks from the crown up and the crown were rebuilt. No. 1 and No. 2 were also rebuilt about the doors. The inside walls just above the bags have been repaired where they burned out and bottoms and fire boxes of course had to be rebuilt. However, the walls of the kilns have been up to two years ago as good as when first built. No. 4 is not in as good condition as No. 1 and No. 2; neither is No. 3, although it has been standing only eight years. All the kilns are very lightly banded.

Some years ago I understood that a fifteen and a half foot kiln was considered the ideal size. I think our experience would indicate that there was some truth in the theory.

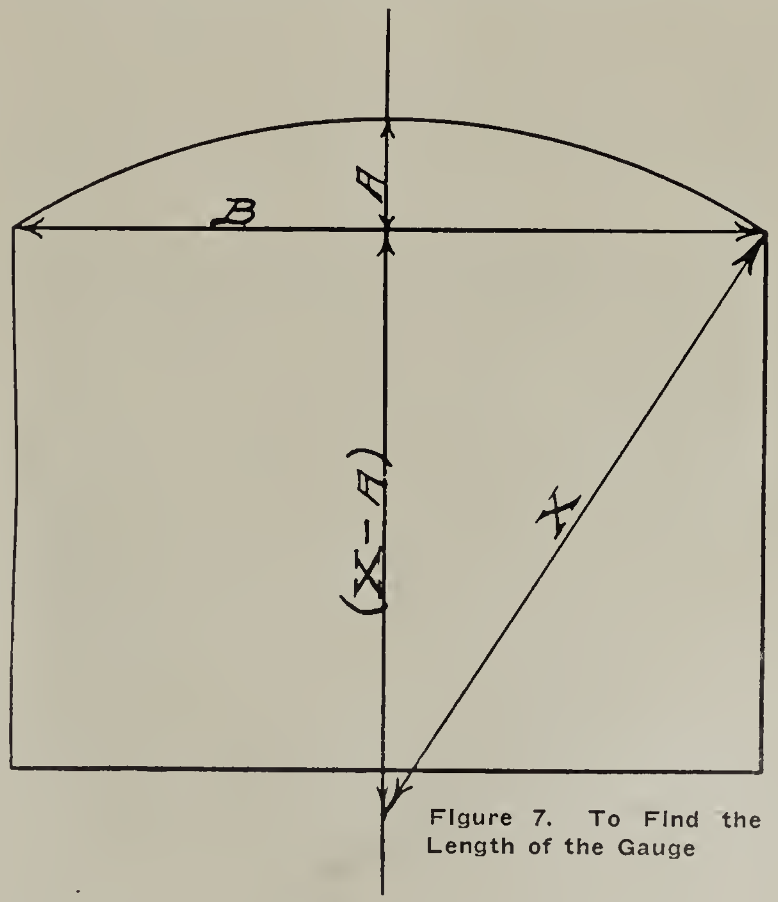


Figure 7. To Find the Length of the Gauge

Prof. Orton: I want to say I derived benefit from this paper. It shows the necessity of getting down with the kiln, or the drier, or the tool that you may be using and making an extensive study of what its performance is, and then remedying whatever defects you may find. The paper as an illustration of the mode of study that will give results is, in my opinion, excellent.

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*Volume XIV. Trans. Am. Cer. Soc. p. 387

Prof. Montgomery: I am glad that Mr. Gray has given us this efficiency record for updraft potter's kilns and has tabulated the data for his kilns and for the downdraft kiln which I described last year, so that they may be easily compared.

To make the comparison complete, I will add that for the kiln I described, the saggers were fourteen inches round and square saggers of varying heights but averaging thirty to the bung or 3,750 to the kiln. Mr. Gray does not give the length of burn in hours necessary to reach the designated cones, but I believe that the time was about the same in both cases. I also wish to add that during the time that the data was taken, which has been given in these two papers, the downdraft kilns which I have described and the updraft kilns which Mr. Gray describes, were fired by brothers, both excellent firemen of many years' experience and men who got the full value out of every shovelful of coal used. For this reason this comparison of the two types of kiln is especially valuable.

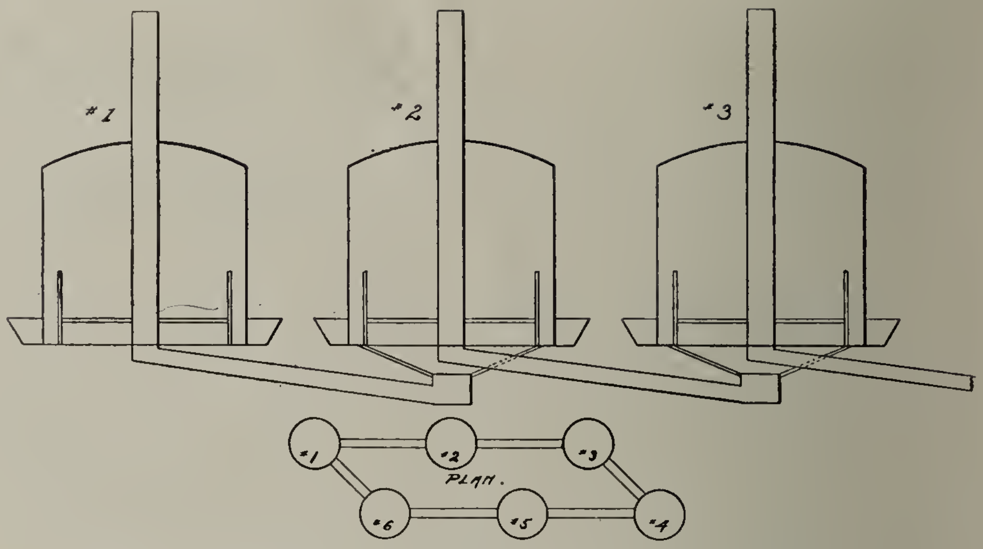
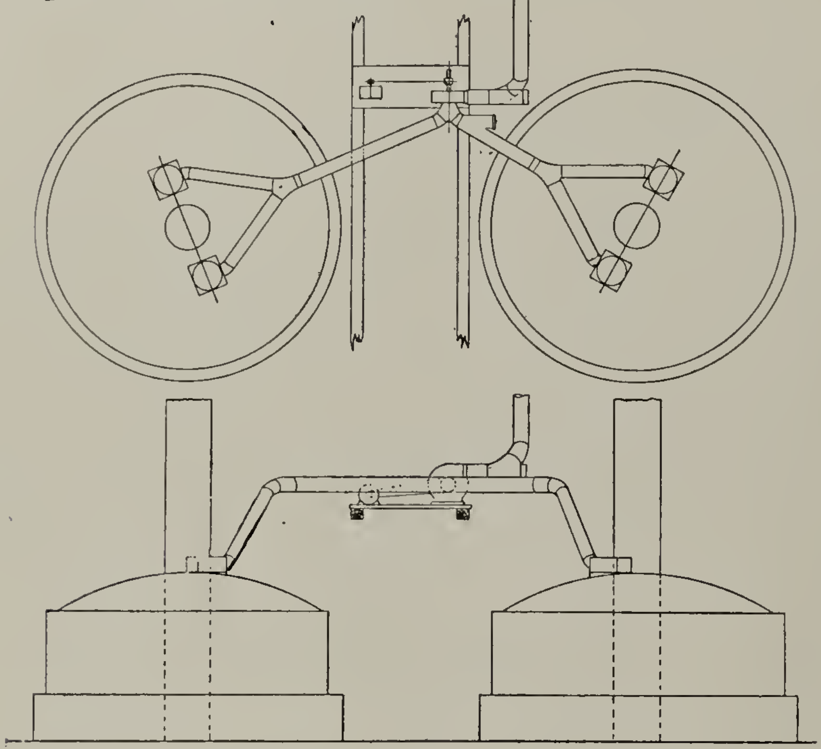


Figure 9. The Continuous System Applied to This Type of Kiln

Figure 8. The Cooling Vents



Considering now the data as given, we see that while we cannot figure accurately the sagger capacity of the two types of kiln in cubic inches of placing space, we can compare them very closely by figuring in cubic feet the effective kiln space in both cases. This we find to be about equal for both types of kiln as described. We see then that the downdraft kiln fired about the same quantity of ware three cones higher, using the same amount of coal, and in the same length of time.

Mr. Gray: The time of burning in our kilns, which Mr. Montgomery asks for, was about forty-six hours for the biscuit and twenty-two and a half hours for the glost kilns. Mr. Montgomery uses one ton of coal to each fire-box, while my figures give eight tons in ten fire-boxes for the glost kilns and a little less than a ton in the biscuit. The great economy I claim is the small expense for repairs my kilns show in the over 50 years they (the No. 1 and No. 2) have been in constant use; and they are good for several years to come.

Another economic feature is the good results we get from No. 1 and No. 2, which we do not obtain from No. 3 with as much certainty. I am satisfied with my updraft kilns.

UPDRAFT KILNS IN USE BY THE NEW ENGLAND POTTERY CO., EAST BOSTON, MASS.

Number of kiln	Diameter	Height to ring of crown	Height to center of crown	Number of fire boxes	Capacity		Tons bituminous coal used in firing[1]	Firing temperatures Cones	Use
					Bungs	Saggars			
1........	15½′	15½′	18′	10	75–80	1800	8–9	8	Gloss
2........	15½′	15½′	18′	10	75–80	1800	8–9	8	Gloss
3........	16½′	17′	20½′	10	90–97	2400	9½	8	Gloss and biscuit
4........	17½′	17′	19½′	11	103–108		11–12	9	Biscuit
MR. MONTGOMERY'S KILN AS DESCRIBED.[2]									
	18′	13′	15½	9	125	3750	9	11	

[1] 2,000 lbs. to the ton.

[2] With an inside stack 3′ 9″ in diameter (outside measurement).

The Greaves-Walker Article on Continuous Kilns

The First Installment of Which Was Announced to Appear in This Issue of the Magazine, Has Taken a Longer Time to Prepare Than Was at First Anticipated, Which Means That it Will Be Exceedingly More Interesting and Valuable When it Begins in the April 4 Issue.

Make a Mental Note—Now—to Read it!

The SUPERINTENDENT

Helpful Hints for Practical Men Whose Problem is Maximum Production With Minimum Cost

Getting Results in Blasting Shale

Few instances of blasting will be found that contain more interest than the method followed on the Cleveland (Ohio) plant of the Medal Paving Brick Company, where the possibilities of this method of clay winning are well demonstrated. Under the conditions existing on this plant, it is doubtful whether any other method could be as successfully employed to bring down the shale from a height of seventy-eight feet and place it within reach of the steam shovel.

Tamping and Stemming the Charges in the Horizontal Holes

The pit is four hundred feet square and has a slight over-burden of yellow surface clay, three feet deep, resting on seventy-five feet of blue shale. Twelve more feet are soon to be added to the face of the banks, as it has been found that the quality of the shale grows better as the depth increases.

The straight and clean-cut bank faces indicate an extremely skillful use of the explosive agent. This result, however, is not due to luck, but is the product of a careful study of conditions. The height of the bank, the blasting qualities of the shale, the effect of the different types of explosives upon it and the method of loading and hauling the material are factors that must be given considerable attention.

The conditions in the pit at this plant are not such that they lend themselves readily to successful blasting, but present problems that must be overcome if good results are to be obtained. The shale is of a very hard character and good work is required to reduce it to a suitable shape for the dry pan without preliminary crushing.

The small over-burden is troublesome, but does not present a serious problem. It is brought down with the shale and gathered by the steam shovel, being mixed with the former material in the correct proportions.

Exceptionally strong charges have been set off in this pit at various times. On one occasion 3,800 pounds of dynamite were discharged, bringing down the entire left face of the pit in a strip approximately four hundred feet long. Judging from the estimate that one pound of dynamite will bring down four tons of shale, more than fifteen thousand tons of material were dislodged by this explosion. This amount kept the plant running for more than three months. About one hundred and seventy-five tons of shale are used each day to manufacture 35,000 pavers. This is based on an estimate of five tons of shale to a thousand brick.

A well drill, with a capacity of eighty feet, was used to drill the vertical holes for this gigantic charge. There was a total of eighty-four horizontal and vertical holes, located at intervals of ten feet on both the top and face of the bank, and having a diameter of four and one-half inches. Each hole contained four caps, connected in parallel directly to the source of the current, which is a 13 H. P. dynamo. The caps were all set off at one time, by means of a switch, thus increasing the power of the charge. The counteraction of the several charges set off at one time reduces the material to a finer condition than if fired separately.

The accompanying illustrations show the placing and firing of two hundred and eighty-two pounds of nitro-starch powder from a "snake-hole" arrangement. Enough material was brought down in this case to supply the machine room for about three weeks. A steam drill was used to bore the horizontal holes for this charge. Vertical holes were not used, due to the "toe formation" of the part to be blasted.

The "snake-hole" arrangement spoken of is very effective for blasting of this kind. The holes are drilled in groups of three, being started within a few inches of each other at the face of the bank but increasing in distance as they grow deeper. One hole is drilled twelve feet, another sixteen feet and the third, twenty feet into the bank. In this case there were six of these groups, and the diameter of the holes was four and one-half inches.

The Result of a Well-Placed Charge. More Than Twelve Hundred Tons of Shale Falling in a Crumbled Mass Into the Pit

It has been found that holes of a larger diameter, if properly stemmed and tamped, give more effective results.

About sixteen pounds of powder were placed in each hole with a stemming of broken "green" brick. Another good stemming material that is easily obtained on the clay plant and which possesses the property of shock absorption, is the grindings from the dry pan. This material cannot easily be thrown from the hole.

In the case of this "shot," the caps, which were attached to the lead wires from the generator, were all set off at once. One of the pictures shown in the accompanying illustrations was snapped a fraction of a second after the explosition occurred, and shows the mass of shale being brought down by the blast—probably over twelve hundred tons. The hard, stratified shale was transformed to a crumbled, fragmental material produced by the shock of the blast.

In locating the holes for placing the charges, it is figured that when they are less than twenty-five feet deep, the distance back from the face of the bank should be about one-third to one-half the depth of the hole, and the distance from center-to-center of the vertical holes should be from one-third to one-fourth the depth. However, in both cases a great deal depends on the blasting qualities of the shale.

On large charges set off at this plant, two or three caps are always used in each hole, and occasionally four. This is done for the reason that should one or two caps fail to explode, the powder would still be set off and the danger of an unexploded charge be eliminated. It is false economy to save caps. Their value is so small in comparison with that of the powder, that it does not pay to use an inferior quality or too few, to say nothing of placing the lives of the men in jeopardy.

To insure, as far as possible, against danger, the caps are tested with a galvanometer immediately after the stemming is tamped over the charge and just before the connection with the lead wires is made. If the cap is in good condition, a slight current passes thru the instrument.

An original and very effective method of insulating the caps may be found in use at this plant. When several caps from one hole are connected to the lead wires, there is danger of connecting both wires from one cap to the same lead wire. To obviate this, a specially prepared cap is used, the wires of which are insulated with differently colored materials—one having a red insulation and the other, white. In connecting these caps all of the red insulated wires are connected to one lead wire and all of the white wires are connected to the other lead, thus preventing any premature closing of the circuit.

The plan of drawing the current for electric blasting directly from the source of power on the plant is undoubtedly the best method. The difference in the strength of the cap bridges, if there happens to be any, will not affect the setting off of the charge, for the current is usually strong enough to fuse them all simultaneously. Should a weak source of power be used, a difference in strength of the cap bridges would prove troublesome, if not dangerous, as it would cause an early discharge of some caps and a tardy discharge of others. It is considered sufficient, however, to allow one-half ampere for each cap on a one hundred and ten volt circuit.

Nitro-starch powder is used at this plant for several reasons. It is a very low-freezing extra-dynamite; it is safer for plant use because it is not so sensitive to shocks, and is considerably cheaper than straight dynamites. In this case, also, it has been found to give more uniform results. Due to its non-freezing property, much trouble is saved by eliminating the necessity of thawing.

Saving Fuel by Removing Soot

A very bad thing about soot is that if you do not get it off the boiler tubes it is liable to bake there, and when it does bake, serious trouble may result. A writer in "Factory" recalls one case of a return tubular boiler that will serve as a good example of soot scale. There was almost a quarter of an inch of it baked to the tubes. On reaming out one of the tubes a leak was developed and the boiler inspector condemned all of the tubes. The leak was due to the acid action of the sulphur baked on with the soot. The tubes were found to be pitted in many places. Now, the next time you inspect the tubes of your boiler, see if there are any traces of such scale upon them.

One boiler company says in its trade literature: "What a boiler may do when clean and what it does when foul are very different things, and the magnitude of the difference is very seldom understood by owners of boilers. It must be remembered that the moment a boiler begins work, its heating surface begins to foul, both inside and out. The importance of being able to clean a boiler thoroly, outside as well as inside, and of keeping it clean, was well demonstrated by a comparative test made by one of our engineers some time ago on a boiler which had been allowed to run some months without cleaning and had accumulated a thickness of one-eighth inch of soot on the tubes. Before cleaning, the evaporation was found to be 8.04 pounds of water per pound of coal; and after cleaning, the evaporation per pound of coal was 10.30 pounds. Here was a case where the removal of one-eighth inch of soot increased the evaporative efficiency more than twenty-eight per cent."

No specific kind of soot-blowing device is recommended. There are many kinds, and you can take your choice. But it is well to remember that thoro cleaning cannot be accomplished when you blow against the draft. Moreover, the soot that you do blow from the tubes is driven back into the combustion chamber of the boiler, from whence it is again picked up by the draft and deposited upon the tubes. Just get behind the soot and blow until it is all driven up the chimney.

The Operation of "Mechanical Firemen"

In the boiler room of the clay plant that generates its own power, there are many problems which, perhaps, have not been given as much attention as conditions warrant. One of these is the proper firing of boiler furnaces.

Among the obstacles to efficiency in that work, the fireman is often the greatest. Filled (as he sometimes is) with old stoking traditions, his progress is questionable.

The mechanical stoker is fast gaining in popularity. The two types that have come to be generally accepted are the underfeed and the overfeed, or chain-grate.

One, as the name indicates, is constructed so that the fresh fuel is fed under the bed. The gases distilling from it are thus compelled to rise up thru a white-hot mass of coal, by which they are raised instantly to the ignition point. Air is supplied under pressure thru tuyeres at the sides. A hydraulic or steam plunger forces fresh coal in from a hopper feed, and both the plunger and the blower are controlled automatically by the load on the boilers.

The chain-grate type is designed to give a front-to-the-rear movement of the coal and the idea is to so regulate the speed of the moving grate that by the time the fuel reaches the back end it is completely burned. The theory is always to have a certain amount of coal in various stages of combustion on the grate surface.

Side- and front-feed, inclined rocking-grate stokers are other types that have yielded good results. A stoker that mechanically sprinkles the coal over the grate surface has also made its bid for favor.

Practically all these types employ a hopper or magazine feed. An attendant may still be relied on to keep the hopper full, but usually an automatic spout-feed from bins overhead is provided. This arrangement saves both operating and handling labor, and is far more reliable.

While automatic stokers are capable of giving high satisfaction, they are by no means fool-proof devices, nor are they superior to hand stoking under all conditions. Intelligent supervision is most essential. The grade and size of fuel commercially available also have a bearing on their efficiency.

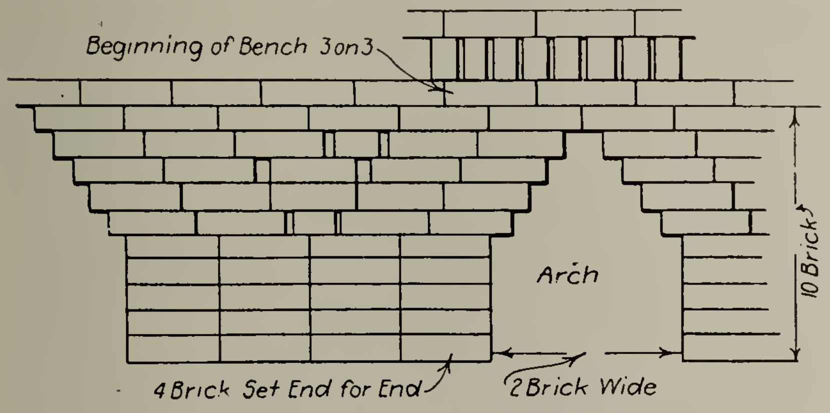
Underfeed types will operate with almost any kind of uniformly sized coal. With chain-grate stokers, however, unless screenings or small nut are available, a crusher must be employed, and the extra process may tip the balance of economy the old way. This type consequently finds its application in large plants—of five hundred horsepower and above—convenient to a supply of low-grade and hence low-priced fuel, which does not have to be crushed.

QUESTIONS *and* ANSWERS

The Best Authorities in Every Clayworking Branch are Called Into Consultation—Their Advice is Free to You, Thru These Columns

Wants to Enlarge Scove Kiln Arches

745. *Virginia—We are about to reconstruct one of our clamp kilns which has twelve arches, each arch being three brick apart, set end to end. In the new kiln we are planning to set the arches a little farther apart, making a ten arch kiln, but each arch being separated by four brick. Do you not think that this change will produce a more uniform burn in the arches and keep them from sticking tight or falling? The arches in the present kiln are set five brick high with five over-hangs which make them ten brick high in all. We burn these kilns with coal, the grates running about six feet back on either side, but not meeting in the middle. By extending these grates entirely thru the arch, do you not think that we could make better burns and save fuel, or would there be too much draft on the fires?*



Showing Proposed Change in Arch Leg

After giving the change which you propose to make, careful consideration, and having studied the sketches shown in the accompanying illustrations, we are inclined to believe that you are on the wrong track in attempting to change the design of this kiln.

In the first place, the twelve-arch kiln which you are now using with a three-brick arch leg is considered to be the best scove kiln practice. In our opinion the reason for your arches sticking and tumbling is that they are too low; instead of being ten brick high, they should be fourteen brick high, seven in the leg and seven over-hangers.

Another mistake you are making is in beginning the bench above the arch three over three. Instead of doing this, we believe that the brick should be set five over two up to within six courses from the top of the kiln, these last six courses being set three on three. The last-mentioned setting, when used over the arches, is so tight that the heat is held in the arches and consequently pulls them down. You should leave plenty of space between the courses which make up the arches, so as to allow the heat to get away or the overhangers are bound to stick and tumble.

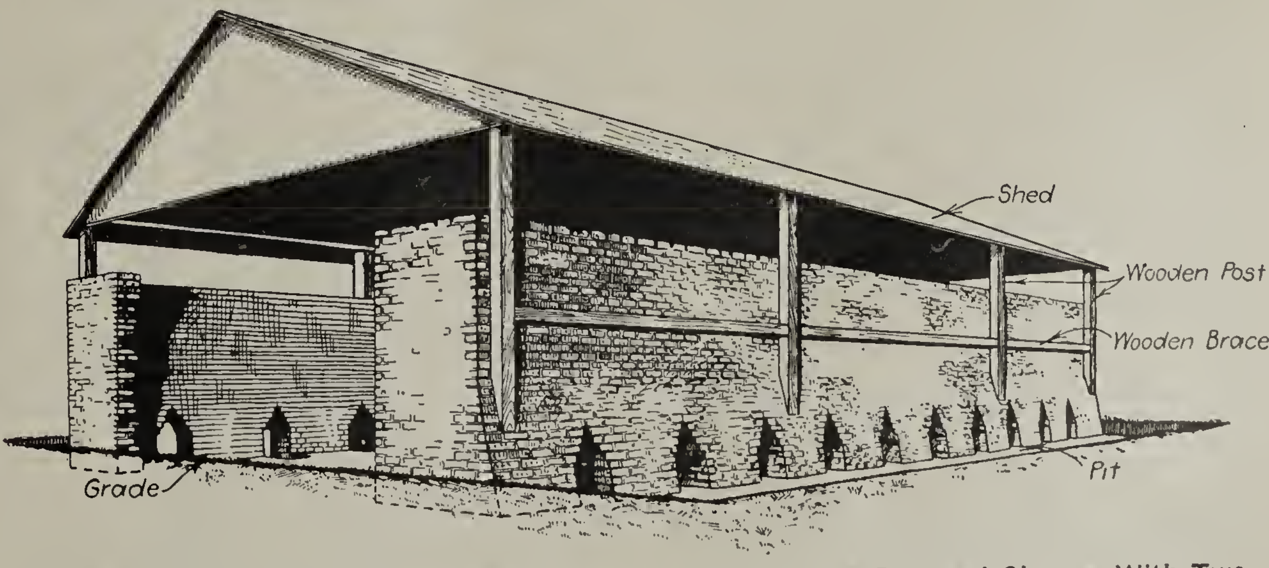
It is our opinion that, in setting a four brick arch leg, you will have more trouble than has been experienced heretofore, as it will take more heat to burn the two inside courses of the leg than it did when there was only one. In only a few special cases, with clays that stand a high temperature, has the four brick leg proved successful.

We also believe that the six-foot grates, which you are now using, are plenty long enough and that nothing would be gained by making a change. The width of the arches in your present kiln is correct and need not be changed.

A Kiln For Burning Lime

744. *England—Can you give us a sketch of a kiln for burning or calcining lime?*

Before submitting a sketch and description of a kiln for calcining lime, magnesia and other similar materials, it may



The Permanent Wall Scove Kiln as It Would Appear After the Proposed Change, With Two Arches Eliminated, or a Total of Ten Arches (745—Virginia) be of interest to give a short description of the old "pot kiln" which has been used in years gone by, and still may be found in many localities. Fig. 1 of the accompanying illustrations is a modified sketch showing an improved form of such a kiln in vertical section. This kiln is equipped with a grate while the primitive kilns were grateless. As the sketch shows, the interior resembles a funnel in shape and is filled with layers of the rock to be burned alternated with layers of coal or coke. In this way the material to be burned comes in closer contact with the fuel than otherwise.

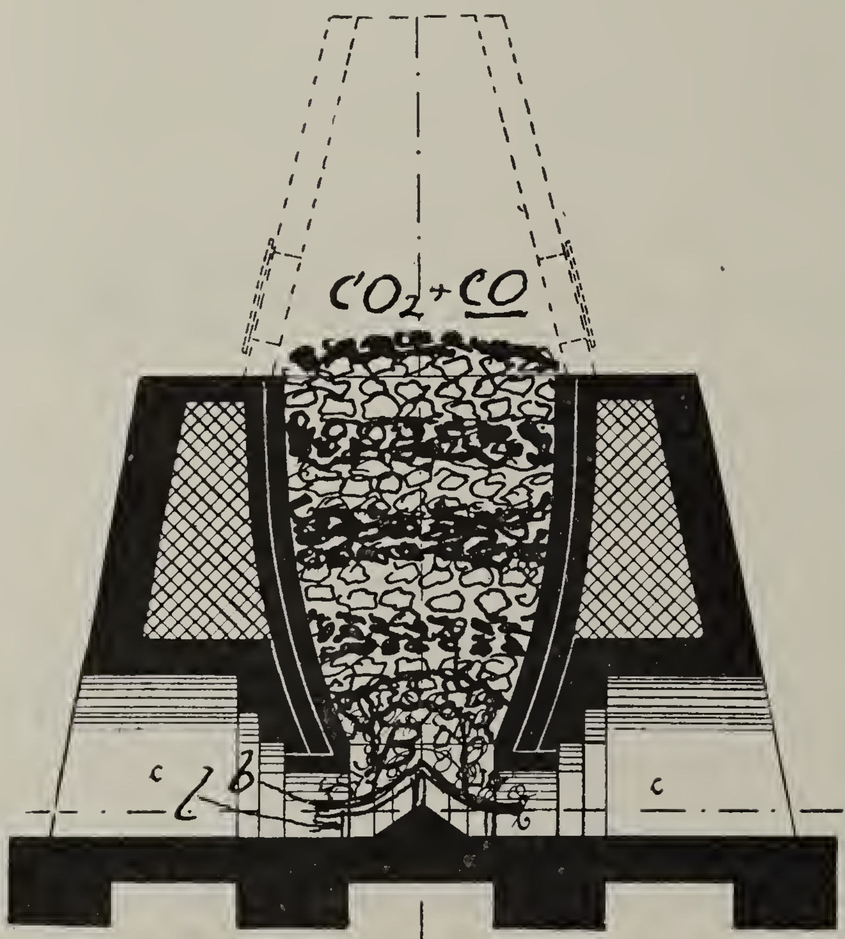


Fig. 1

It is also evident that when bituminous coal or ordinary soft coal is used in this kiln, the volatile combustible matter, amounting to about thirty per cent of the fuel, gets lost before the coal arrives in the burning zone. When coke is used, a considerable loss in fuel is caused by the reduction of the carbon dioxide (CO_2) to carbon monoxide (CO) which is a combustible gas and escapes unburned. Therefore, in spite of its working continuously, this kiln is a waster of fuel.

In some localities similar kilns are fired periodically, in which case, as is indicated in Fig. 1, an arch is built above the grate with the rock to be burned and the kiln is fired until the calcining heat has reached the top of the burning chamber. When wood is used as fuel under the arch, the grate is usually eliminated.

From this primitive or "pot kiln" the stack kiln with outside furnaces has been developed, as is shown in Fig. 2, elevation and plan.

In this kiln the fuel is either burned in furnaces upon grates (r) or in a separate gas producer which is not shown in the sketch. When the latter method is followed, the gas is introduced into the furnace or arches thru ducts marked (c). The stone is calcined or burned in a combustion chamber (B) which is above and between the furnaces. The chamber is about five feet in diameter. The burned material is cooled in the lower part of the kiln from which it is drawn at intervals of about two hours, and in equal quantities. In this part of the process the burned material is lowered into the hopper (A) from which it is discharged later into cars (W), wheelbarrows or is drawn away by a belt conveyor. After each draw a corresponding quantity of green or unburned rock should be placed in the kiln in order to keep it well filled at all times. The average output of such a kiln is about ten tons a day, the coal consumption, when producer gas is used, being about one pound of coal to five pounds of the burned material.

It might be added that each kiln with its furnaces or gas producer should be especially designed for the rock and fuel which are to be burned and gasified. Various kinds of rock show different results in the kiln and cooler, and require a different calcining temperature than other kinds. For instance, certain types of magnesia-lime rock and white magnesite crumble into powder when burned and fill the cooler tightly, which also partly chokes the draft in the burning chamber. By examining and testing samples of the rock and fuel, an expert can determine the proper design and dimensions of the kiln that is best to use.

Wants to Make His Own Analyses

758. *Illinois—In your book "Clayworking Problems," there is a question asked by No. 680, Quebec, in which, according to my opinion, you do not clearly explain about the analysis of lime. We are very much troubled with both sulphur and lime and I would like to be in a position to make my own analyses of our shale so that I can tell how much iron, lime, sulphur, magnesia, silica and alumina is contained in the shale and whether this proportion changes as we get further back*

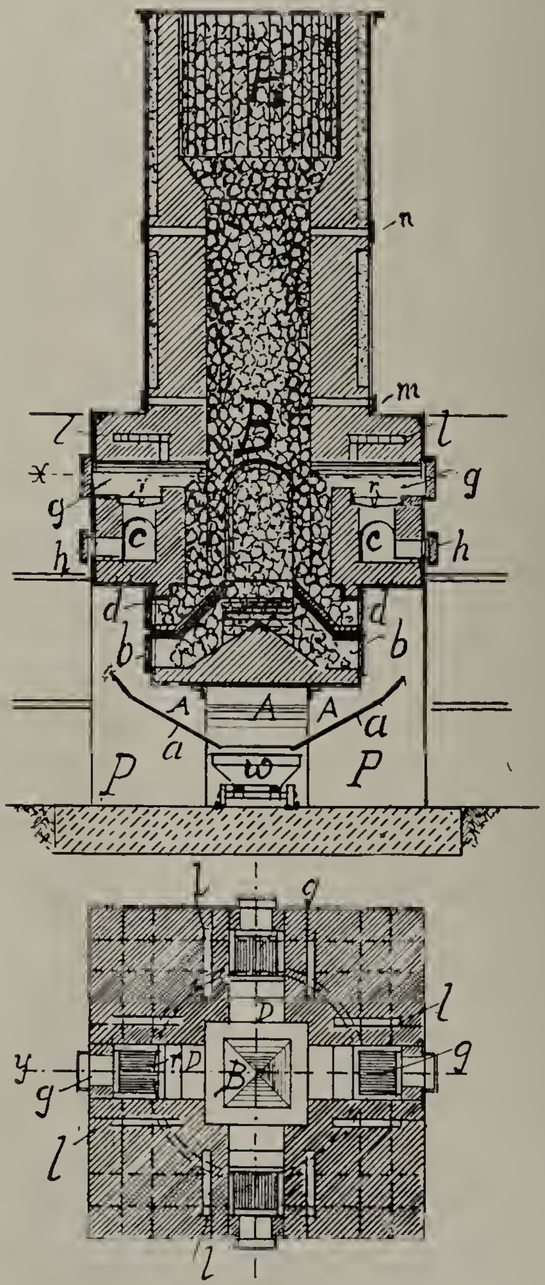


Fig. 2

into our bank. I would like to be able to do this without going into a great amount of expense for chemicals and utensils.

I have been reading Jackson's "Text Book on Ceramic Calculations" and note that on page 3 (examples 3 and 4) the answer is given but the author does not describe the manner in which this solution was arrived at.

The same may be said in connection with the Bischof formula published on page 176 of Ries' "Clays: Their Occurrence, Properties and Uses."

While we are at all times willing to give information that will enable any one or more of our readers to help themselves to a more scientific knowledge of the materials with which he or they are working, this reader requires something which might well be called a correspondence course in ceramics, and that is away beyond the scope of this department.

The knowledge he is anxious to acquire can and should be obtained at a ceramic school, and we strongly advise his making arrangements to take the short course at Alfred, N. Y., which will be held from April 17 to 20. A notice of this course is printed on another page of this issue.

It is too bad that this reader did not take the short course at Urbana, Ill., held January 10 to 22 of this year.

Making Paving Brick From Surface Clay

760. *Nebraska—Can paving-brick be made from a strong surface clay, with a certain per cent of shale mixed? Our clay contains a high percentage of iron oxide. Are there any books published on the subject of paving-brick manufacture which would give formulae for mixing surface clay and shale to insure a proper material from which to make paving-brick?*

Paving-brick have been made with a mixture of a surface clay and shale but it is not the usual practice. There is no published information that would be of any assistance to you in regard to mixing your own clays and shales to make a good paving block. The mixture is not the important point—it is to make a paving block that will pass specified rattler tests. If you have an idea that your materials will make good paving block, make a mixture of different proportions of clays and shales and run them (or have them run) thru a machine, dry and burn them in a practical way and then have rattler tests made. It will be necessary, of course, to make each "batch" or mixture produce enough brick to give a full charge to the rattler, (see reports of American Society for Testing Materials) and to keep very accurate records of what proportions of clay and shale are used in each "batch" as well as what treatment is given in connection with the drying and burning. In other words, it is necessary to have these tests as practical as tests can be made and nothing which even distantly approaches the theoretical will be of any value to you.

Pebbles Break Cutting Wires

742. *Nebraska—I would like to get your advice on grinding clay. Some of our clay contains small pebbles or gravel and one layer contains soft lime concretions. The latter burn white and do not slack in the burned brick but will crack some of the brick in drying and being rough, will break the wires on our cutter. The gravel breaks the wires also when it comes opposite the opening between the platens on the cutter.*

We use a disintegrator for breaking up the clay but we cannot get it close enough together to break up the pebbles sufficiently small to save the wires. Our clay is wet enough most of the time to pug without adding water at the pug mill; so we do not think that we can use a dry pan. Would a wet pan do the work in breaking up the pebbles and concretions fine enough so that they will not break our wires, or would a smooth roll disintegrator do it? We make side-cut stiff-mud brick.

As your clay comes from the bank in a very wet condition, it will be impossible to get any efficiency out of a dry-pan, while a wet-pan would be entirely too slow for the work. A wet-pan is a mixing machine and not a grinding machine. It would seem advisable to put this material first thru a disintegrator and then thru a smooth roll crusher with the rolls set close together.

If possible, the disintegrator should be set directly upon the rolls or a combination disintegrator and smooth roll crusher should be installed. This should eliminate the trouble—at least it will better conditions very materially.

A BRICK FARMHOUSE BUILT *before the* CIVIL WAR

While built-with-brick farmhouses are a current topic, it might be interesting to note an instance where one such structure has stood the test of time and the elements, and looks as well today as it did in 1854—the year it was built.

The house which is shown in the accompanying illustration is located near Davenport, Ia., and was built with brick that were made by a German brickmaker on the site of the building. The clay used in making the brick was secured from the farm now owned by L. W. Schmidt, which is located about two miles from where the house stands.

The building was erected by the grandfather of the present occupant. Its walls are twelve inches thick and are of a medium red color. No paint has ever been used on them. The house is very warm in winter and is absolutely dry on the inside no matter what the weather.

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It never balks on heavy loads or grades
Why not let the Dewey do *your* work?
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The LETTER BOX

A Place Wherein Letters
That Have General Interest Are Published and
Commented Upon

Interest Increases in Mason Contractor Course

That the recent action of the Iowa Clay Products Manufacturers' Association at its annual meeting held at Ames, in calling upon its members and the state college to cooperate in establishing a short course for mason contractors, has struck a "sore spot," is evinced by the interest that is being taken in the matter. Several manufacturers have since yelled "ouch" but are looking with hope toward what promises to be an effective "balm" for the country "arch-i-tect" and builder who has long been a thorn in their sides, owing to his antipathy for burned clay materials. Writing along this line, H. M. Baldridge of Illiopolis, Ill., says, under date of February 23:

> Referring to the article entitled "Increasing the Number of Mason Contractors" which appeared on page 343 of the February 15 issue of "Brick and Clay Record," I would like to know if a man from Illinois would be admitted to this proposed course. Also what time and necessary expenditure would be required.
>
> I surely agree that the worst foe of the clay products manufacturer is the contractor who does not appreciate the advantages of burned clay construction, or worse than that, does not care to learn. We have hosts of them in the small towns who control a large territory that should be a rich market for the manufacturer of clay products.
>
> I sincerely hope that the Iowa people will be able to carry out their plans.

Mr. Baldridge has been put in touch with the proper authorities to answer his questions. Just what will be the scope of the proposed mason contractors' course at the Iowa State College and what its cost in both money and time will amount to, will, it is hoped, be set forth in a short article to appear in a near subsequent issue of this magazine.

Suggests Improvement in Price Making

The following letter, which comes to us from J. Harry Allan, Secretary and Treasurer of the Winchester (Ky.) Granite Brick Company, will be interesting reading for those who are called upon to quote prices on delivered shipments. It bears date of March 10th, and reads:

> I note in the short stories that you are publishing in the "Salesmanager" department an article referring to quotations made f. o. b. destination, and I cannot see that your suggestion helps over the difficulty at all, as it still leaves the burden upon the shipper.
>
> Why not take our cue from the railroads themselves and say, in making our quotations, "The present freight rate named us is five cents per cwt." (or whatever it may be), or phrase it this way: "We quote you our brick per M., f. o. b. destination, under the present freight rate named us."
>
> This may be called a "joker," but it certainly relieves the shipper of any burden of overcharge or of any advance in freight rates.

A still better way would be to "take the bull by the horns" and say exactly what you mean. Nearly every concern carries what it calls a "strike clause" at the top or at the bottom of its quotation blanks and letterheads. When this custom was first adopted in the clayworking industry, it caused a great deal of comment among contractors, who believed—because they had been led to believe—that the manufacturer of building materials should take all of the risk, particularly as the contractor was in many cases subject to a penalty for delays.

In our opinion, the correct way of quoting delivered shipments is as follows: "Blank dollars per M., f. o. b. our factory with freight allowed to destination. This price is based on the prevailing freight rate, as quoted us, which is blank dollars per net ton (or cwt. or M.). No freight allowance will be made by us in excess of blank dollars per M. brick." This form of quotation cannot be accused of carrying a "joker," because it very plainly says what it means. Some shippers, working in the fog of old time ideas, will object, because it gives the party receiving the quotation an opportunity of figuring back and seeing just how much is being charged at the plant. But even they will, in time, come to see that they gain nothing by clouding the issue.

In the event of any contractor or builder making an objection to this form, it would only be necessary for the brick manufacturer to suggest that this contractor verify the freight rate, and so "protect" himself.

Believes Advertising Will Remedy Weak Market

There is no doubt but that some of us have little faith in the power of advertising and publicity to expand our markets and increase prices, or, ever having had faith in this seemingly wonderful agent of modern business, have lost it thru discouragement brought about by the failure of impractical and half-baked schemes that have proven a failure and wasted money. If you feel that way about it, a good tonic is contained in the following letter from T. J. Evans, Jr., vice-president of the Evans Clay Manufacturing Company:

> There are a thousand and one things the clay interests could accomplish to bring their business before the purchasers in this country, and among the many ways possible, I am firmly convinced that proper advertising will take care of a large percentage of the clayworkers' troubles.
>
> I feel safe in saying that more advertising money is being spent monthly for tooth paste than all of us combined ever spent on all of our products, and our total expenditure in this direction would look like "small change" beside the bank roll spent annually by the chewing gum profession, the soap artist or the baking powder family. Yet clay products, as a group, are just as susceptible to the power of publicity as any of these because they are consumed just as universally and are vastly more important to the public welfare.
>
> The clay products manufacturer can pave the way toward making the bad years less numerous and less severe by stimulating a demand for his products, and I certainly feel that publicity is the proper way. Why, if we could only secure fifty per cent of the business that is annually lost to substitutes and other inferior classes of goods, it would be impossible for the existing clay plants to handle the business.

The above letter contains food for considerable serious thought. While indications point to a record-breaking volume of sales in clay products during 1916, and while only in isolated sections can the market truly be called "weak," still this does not mean that advertising campaigns and other publicity plans are to be abandoned at this time because they are believed unnecessary.

On the other hand a great opportunity is presenting itself to every manufacturer of burned clay materials for aggressive action during this year of activity—1916—to entrench himself in his market, armed with the weapons of advertising and publicity, so that when a lull in demand comes, it will never be felt. Now—this year—when

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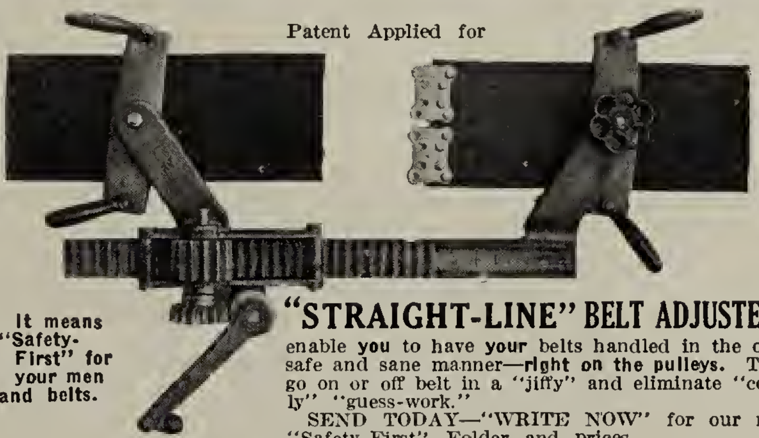

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We pioneered the Sand-Lime Brick business in America.
We have the "Know-How" and the Equipment.
Let us Serve You.
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A Price Pyrometer furnishes absolute information.

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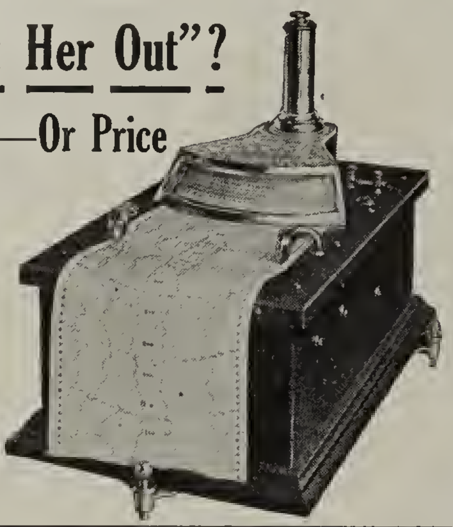

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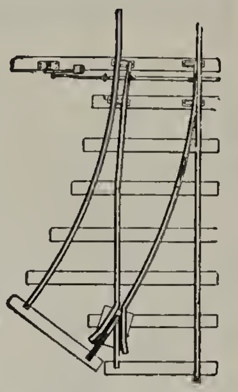

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money will be plentiful and inclinations freer, is the time to institute an advertising campaign that will tell prospective customers what you make and how its use will give greater comfort and save them money.

The Semi-Monthly Trade Review

SPRING is here again, and not in years has it brought with it such a message of good cheer as does the 1916 vernal equinox.

Activity in building is reaching new high levels in many sections. Official reports covering the value of permits taken out in the United States during February show a gain of twenty-five per cent when compared to the corresponding period last year. This increase, however, contains more significance than is exhibited by cold figures. When it is remembered that the volume of prospective building is steadily growing in the face of higher prices for both labor and materials, then is a full realization possible of the meaning of the above gain.

No particular section of the country seems to overshadow the others in increases, the expansion being nation-wide. When one observes that there is an increase in Portland, Me., of one hundred and ninety-eight per cent and in Portland, Ore., of thirty per cent, little further evidence is needed to prove this point. It is also gratifying to note that in certain sections where recovery has been slow, especially among the cities on the Pacific Coast, there are now numerous indications of a return to normal activity within the near future.

FARMERS TO BUILD EXTENSIVELY

In Chicago, February showed a gain of fifty-six per cent in the value of permits filed, which foreshadows an active spring. Reports are also coming into this center from the Middle West that weather conditions have been encouraging to the farmers, resulting in a wide starting up of spring work with preparations being made for outside building and construction.

In Boston, February building showed a gain of twenty-eight per cent. However, at the present time, unsatisfactory weather and poor traffic conditions are interfering with further progress. These obstacles, it is expected, will soon be cleared away.

In Philadelphia, notwithstanding a considerable increase in the cost of building materials, sharp advances being established on almost everything entering into construction, many new projects are under consideration and the coming spring is expected to be very active. Strange to say, Philadelphia showed a loss of five per cent in February building. This, however, is not of any consequence, as contractors were busy on several jobs, the construction of which had been delayed from 1915.

Building operations in Baltimore are proceeding at an unprecedented rate, the city building inspector's report showing an increase of forty-eight per cent in new work for February, when compared to the same month in 1915. This condition has been reflected in the business done by local brick companies.

Another city in the South Atlantic States that has been making a remarkable showing is Richmond, Va., where February building increased forty-four per cent when compared with the corresponding period last year.

Lower temperatures, with snow, recently checked building progress in St. Louis, but well-posted authorities estimate that fully $3,000,000 worth of new projects are awaiting the advent of settled weather to go ahead. Permits for February, usually a dull month, almost doubled those for the same month last year.

Louisville, Ky., shows a gain in new work of one hundred and ninety-five per cent during February, while in Nashville, Tenn., building materials are reported as being in active demand. Several large buildings are being erected in the last-mentioned city, permits for February showing a gain of two hundred and sixty-seven per cent.

HOME BUILDING IN CANTON A FEATURE

The building of homes in Canton, Ohio, is reported as being quite active. This, together with additions to industrial plants and new factories, raised the increase in February building to eight hundred and two per cent. Owing to the presence in this locality of a number of brick plants, it is needless to say that much of this work is being done with the best of all building materials.

Building operations in Toledo, Ohio, thus far this year have exceeded any previous similar period. This city reported an increase for the second month of the year of fifty-four per cent over February of last year. In Detroit, building has scarcely slacked all winter and, with the approach of spring, a still larger volume of work is being planned. A gain of sixty-seven per cent was reported for February in the value of permits issued within the boundaries of "The City Where Life is Worth Living."

Building in Minneapolis, Minn., is slowly improving. A steady increase is reported, that for February being two per cent over the same period in 1915. Duluth, the city of which one never speaks without thinking of zero weather and iron ore, is awakening from its winter sleep and is showing signs of an unusually active spring building season. Permits for January and February of this year totaled $285,905, as against $179,802 for the same months last year. It is believed that the record for March in this city will also show an improvement over March of last year.

KANSAS CITY (MO.) HITTING THE BUMPS

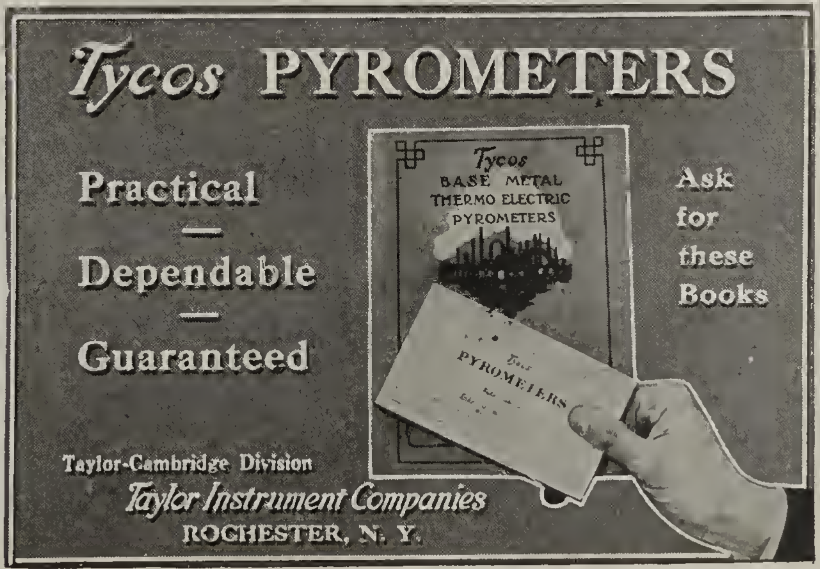
In contrast to rosy reports from a majority of cities, Kansas City, Mo., has experienced no perceptible increase in the demand for building materials, altho a great deal of work is in contemplation. This city shows a decrease of forty-eight per cent in the value of permits for February when compared with the same period last year. Strange to say, Kansas City, Kan., across the river, registered a gain of twenty-six per cent for the same period.

Even Ottumwa, a busy little town in Iowa, reports that

Boss Ten Hour DRYER | Boss System of BURNING BRICK
COMMON SENSE
APPLIED TO
Drying ORIGINAL Boss SYSTEM Burning
Write today for a catalog
JOHN C. BOSS COMPANY
Monger Building, - Elkhart, Indiana

Don't think of
CARS unless you think
YOUNGSTOWN!
There's a good reason—it's quality!
The Youngstown Steel Car Co.
YOUNGSTOWN, OHIO
ASK US

STRENGTH UNIFORMITY DURABILITY
REG. U.S. PAT. OFF.
Even a tough steel wire is only as strong as the loop. Our wires are made of Swedish steel, and the loops have the three points of strength as noted.
For Cutting or Screening use wires that are twisted, wrapped and soldered.
THE WEBB WIRE WORKS
NEW BRUNSWICK, N. J.


Tycos PYROMETERS
Practical — Dependable — Guaranteed
Ask for these Books
Taylor-Cambridge Division
Taylor Instrument Companies
ROCHESTER, N. Y.
Tycos
BASE METAL THERMO ELECTRIC PYROMETERS
PYROMETERS

IT SAVES ITS COST WITH ONE CATCH

In making it possible to discover **on time** each—and every fire, in preventing theft, vandalism—and sleep—in reducing your fire insurance.

Hardinge Watchman's Clock

pays its own purchase cost in short order, and can save by prevention as outlined above, thousands of dollars. Let's talk it over.

HARDINGE BROS., Inc.
1760 Berteau Ave., Chicago, Ill.

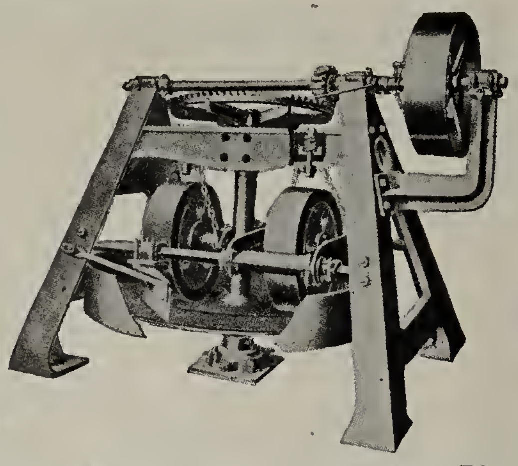
Approved by National Board of Fire Underwriters.

ARMLEDER Motor Trucks

FOR ECONOMICAL HAULING

HAVE the strength and pulling power necessary for your work. Our new sales policy means a big saving to the purchaser. *Write us for Motor Truck Catalog and further information.*

THE O. ARMLEDER CO. Cincinnati, Ohio



THE EAGLE DRY PAN

Write for Prices

EAGLE IRON WORKS DES MOINES, IOWA

With your Shovel ?
In a hurry ? Must have clay ?
The Beam swings and drops,
Rips and rams
For dipper load—
Swings back—then dumps—

and the chains—"They will not break"
if they're WOODHOUSE SPECIALS
We'll tell you why.
WOODHOUSE CHAIN WORKS Trenton, N. J.

as spring approaches, building becomes more active, a greater amount of construction work being in sight than for the last ten years, which speaks well for prospects in the Hawkeye state.

Many other localities, too numerous to mention, show building gains and highly encouraging prospects for an unusually active spring. Losses are few in number and come from scattered points, New York City being the most conspicuous among these. The permits taken out in that city for new construction during February amounted to only $8,801,906, a decrease of 17.9 per cent from the $10,717,827 total in February, 1915. This falling off is almost entirely accounted for by the pronounced contraction in the Boroughs of Manhattan and the Bronx, as Brooklyn reports an increase of one hundred per cent, while the losses in Queens and Richmond are insignificant.

NEW YORK BRICK MARKET FIRM

Altho the demand for brick on the New York market has been light during the past few weeks, prices have remained firm, ranging from $8.50 to $9 per thousand. Raritan (N. J.) brick is in short supply because of a large quantity that has been ordered in advance upon which deliveries are being made. Now that spring has arrived, prices of both this and Hudson River brick are expected to advance by easy stages under pressure of a strong demand.

Disregarding precedent, business, generally speaking, steadily grows in volume at a time when more or less contraction is usually experienced. Prices continue to rise, bank exchanges are very large and business mortality is at a low ebb. With the exception of the freight congestion in the East and labor troubles, which are signs of the times, everything points to a very satisfactory state of affairs in all lines of industrial endeavor, of which clayworking is an important part.

Key-James Company Shows Faith in Better Times

Albert B. Adams, assistant general manager of the Key-James Brick Company, Chattanooga, Tenn., writes that business is excellent. This company started the year 1915 with three million brick in its stock sheds. In spite of this fact, the plant was operated to capacity all during the past year, manufacturing twelve million brick and finishing the year with an empty yard. A new thirty-foot, round down-draft kiln was recently built, making a ten-kiln battery. This plant is now producing a sand-face colonial brick, both in "reds" and "gun metals," that are as near an exact reproduction of the old slave-made brick as can be made. This company is the first southern manufacturer of face-brick to ship north of the Ohio River, having furnished a number of jobs in Cincinnati, Ohio. Building operations in Chattanooga are active. A number of factory buildings, warehouses, a twelve-story office building and large steel plant are now in process of construction. The University of Chattanooga is making a number of additions to its buildings which are valued at $500,000 and for which the Key-James Company will supply the brick.

Method of Testing Decorative Tile in Germany

In an interesting article by Dr. L. Reese, the "Die Kalk, Gips und Schamotte Zeitung" comments on the testing of tile, in a recent issue.

In Germany the water absorption test of tile usually takes place in the office of the architect. These tests, however, are very seldom carried out in a correct manner for, as a rule, the tile are laid in water just as they are received from the manufacturer and left there until the architect thinks that the tile are saturated. The difference in weight after the tile have been removed from the water, as compared with their weight before being immersed, is then considered to be the water absorbing capacity of the tile. This method of testing, however, contains several inaccuracies, which, of course, do not give correct results.

Tile used for government buildings in Germany are subjected to a severe test by the Imperial Building Materials Testing Institution. The tile is first dried on a fire in order to drive all of the moisture from it. It is then only partially put into the water and not totally immersed, as is usually done. The reason for only partially wetting the tile is to allow the air from the numerous pores in the material to escape which, if allowed to remain, would affect the accuracy of the test. Slowly the tile is put further into the water until, after two days, it is entirely covered. After six days it is taken out, as experience has taught that a longer stay under water has no influence on the weight of the tile.

CONVENTION ECHOES

Did anyone see Jim Hoskins after the smoker?

H. Haigh told 'em that he "made the kiln long so that it would burn short."

Where did Joe Shaw spend his time when he was not running a "restaurant"?

Annie Noyes writes that "if there ain't gonna be no smoker next year you can count me among the missing."

Ot. Helfrich insisted on describing to Al. Angelow the best method of "monkeying with the shipping."

Ralph Perrott beat his Detroit record by making one pair of suspenders last thruout the convention. Nothing like practice to make a perfect score.

Andy Schultz contracted to show to D. A. Cable of just what stuff Cleveland is made—and it's a large town. How little we know about that of which we are so sure.

Elmer E. Miller has collected one hickory stick and one pile of Irish confetti. He offers them to the government for use on and at Villa.

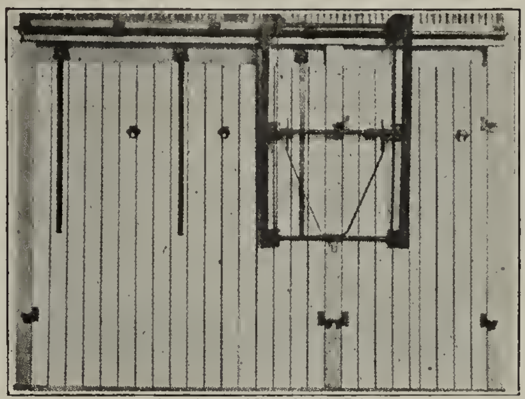
Ralph P. Stoddard looked as tho he had never heard of such a thing as a Complete Building Show, and as tho working eighteen hours a day for eighteen days hand-running was a regular performance.

W. J. Snyder, of Brazil, Ind., made one of the strongest speeches of the convention, regarding the proper way of handling promotion funds for brick—or anything else, for that matter.

Mason Chilcote, who runs the Ohio State Brick plant at Junction City, Ohio, went to the banquet carrying coals, as it were, to Newcastle. In his absentmindedness, he had completely surrounded a thick steak, somewhere about 5 p. m.

A. S. Cunningham, productive engineer, formerly with a large clayworking machinery concern dropped in to

Keep the Heat in Your Drier


Showing "Carrier" Idle.

Why waste fuel just because your drier doors don't fit tight? They can be made tight in the first place, and kept tight, if you equip your drier with the

Perfected Dry Kiln Door Carrier

Will handle doors from 2' to 8' wide and 5' to 8' high. Made for wood or fireproof construction. Write for catalog B2 and all details.

Sold on 60-day trial.

Dry Kiln Door Carrier Co.
Indianapolis, Ind.

PYROMETERS

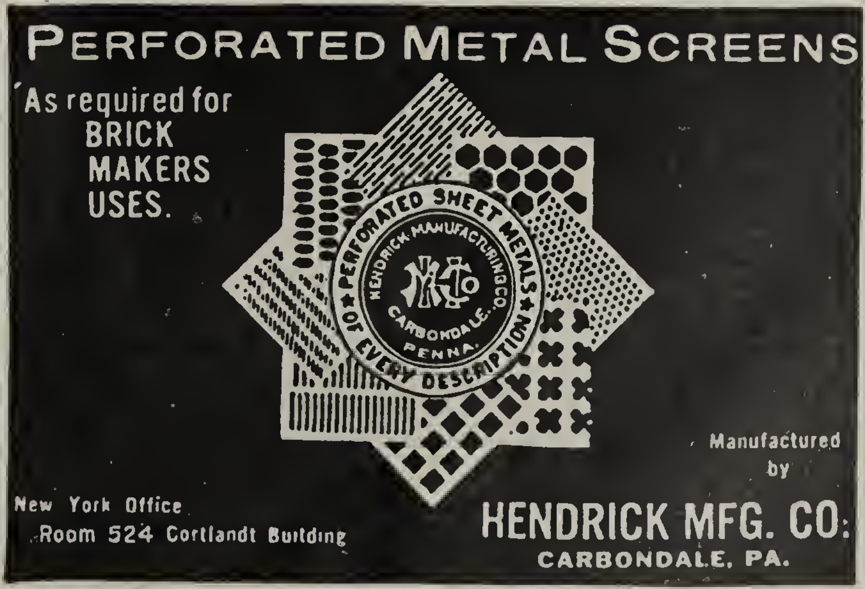
One customer using Brown Pyrometers writes, "Had we had your Pyrometers when we started in business 20 years ago we would be rich today." Why don't you start right at once?

The Brown Instrument Co.
Philadelphia, Pa.
New York Pittsburgh Chicago

Do You Need Dryer Cars?

Cars that are built heavy and strong—cars that will not warp—cars that will resist for years an alternation of low, wet heats and high, dry heats—cars that will stand rough handling—that only need oil to keep them moving, and bearing full loads, season after season. We have such cars and on these cars we guarantee satisfactory service, and on our Special Cars, Turntables, Grate Bars and Grey Iron Castings.

Pettigrew Foundry Co.
Harvey, Illinois


PERFORATED METAL SCREENS
As required for BRICK MAKERS USES.
PERFORATED SHEET METALS OF EVERY DESCRIPTION
HENDRICK MANUFACTURING CO. CARBONDALE, PENNA.
HMCo
New York Office
Room 524 Cortlandt Building
Manufactured by
HENDRICK MFG. CO.
CARBONDALE, PA.

We Do Not—and We Will Not Sell
Inferior
Pyrometer Equipment

Base metal equipment can not stand up under clay plant temperatures. It is folly to expect it.

It costs less the first few months but the repair bills soon equal and exceed an original cost of quality equipment.

In addition you can not depend on the readings.

We guarantee satisfaction.

The Stupakoff Laboratories
PITTSBURGH, PA.

COAL For All Ohio Clay Plants

We have a splendid coal, perfectly fitted to burning in periodical and continuous kilns. It is

Pittsburg No. 8

This coal will save you money, you burn less to get better results more easily. Inquire now from

The Cleveland-Belmont Coal Co.
505 Republic Building
Cleveland, Ohio

Build with Brick

STEEL HAS ADVANCED in price—but we have **not** advanced the price of the sheet steel "Build with Brick" signs. Orders for a limited quantity can be filled from stock at the old price of $5.00 per hundred. First come, first served. Better order **now.**

BRICK AND CLAY RECORD
445 Plymouth Court CHICAGO, Ill.

"Buckeye Rails Are the Standard for Quality"

THE BUCKEYE ROLLING MILL COMPANY
Exclusively Manufacturers of First Quality Light Steel Rails and Accessories

Offices: Steubenville, Ohio
Mills: Newark, Ohio

BUCKEYE MEANS BEST
BEST MEANS BUCKEYE

All Sections from 12 lb. to 40 lb. per yard
Write or wire us, when in need.

No order too large to handle promptly or too small to secure immediate attention.

shake hands with some of the "boys" on Thursday of the convention.

Gordon Keith, who tore away from his task of getting out the "Canadian Clay Worker" long enough to attend the convention, is quite some professional when mixing among the ladies and at banquets.

A. F. Humphrey of the Fallston (Pa.) Fire Clay Company, who made his maiden appearance among brick men at the convention, looks like a comer. Cuthbert says that the credit for developing Fallston "Weave-tex" goes to "Hump" and that's going some for a yearling.

Ed. Schario, who gives as his connection the Keim Brick and Tile Company of Louisville, Ohio, certainly knew all of the girls in Cleveland. But the best part was that he was not afraid to introduce them to his friends.

Now comes a member of the entertainment committee who claims the credit for having introduced J. W. Lazear to "Brick and Clay Record's" stenographer. He says that this same gentleman paid the bill for a dinner for two that evening, but we think he is jealous, for that was one of the duties of the entertainment committee.

Daniel E. Reagan, president, and Carl C. Walters, salesmanager, of the Hocking Valley Products Company found time between convention activities to give a very fine banquet to their agents at the Cleveland Athletic Club. The "big feed" was "pulled off" on Wednesday evening just before the smoker, covers being laid for twenty-five. Somebody said something about "Dan" stealing a march on the "boys" by staging the dinner so quietly, which makes us feel "sore" because he did not invite us.

IN *the* WAKE *of the* NEWS

Being Brief Mention of a Host of Interesting Happenings in the Varied Fields of Clayworking

PERSONAL

J. R. Pugh has joined the sales force of the Hydraulic-Press Brick Company, at Cleveland, Ohio.

L. A. Steiger, of the Steiger Terra Cotta and Pottery Company, San Francisco, Cal., has been ill for several days, but is now recovering.

Henry E. Fletcher, organizer and president of the Belt Line Brick Company of Minneapolis, Minn., died suddenly on March 4 at Old Point Comfort, Va., where he had gone to recuperate after a winter of ill health.

Philip C. Dunford, treasurer of the Fischers' Island Brick Company, died at his home in New London, Conn., on March 5, after a brief illness. Mr. Dunford was a native of New London, was sixty-eight years of age, and had been connected with the brickmaking industry for a number of years.

H. S. Renkert, general manager of the Metropolitan

Paving Brick Company, Canton, Ohio, was recently elected president of the Canton Chamber of Commerce by a large majority. His administration at the head of this unusually active commercial body will undoubtedly be a successful one.

Samuel H. Wilson, until within a few years owner of the Wilson (Conn.) Brick Company, died on March 2nd at the age of seventy-two years. Mr. Wilson had been engaged in the manufacture of brick from a very early age, increasing his business from a small beginning to a capacity of five million brick a year.

Charles S. Waldo, of the firm of Waldo Brothers, Boston, Mass., dealers in brick, died at his home on March 7. Mr. Waldo was a native of Boston, and was sixty-six years of age. He was admitted to the firm of Waldo Brothers in 1875, and four years later became the sole member of that concern.

Frank Ewoldt writes that his concern—W. A. Spurrier, Jr., and Company of Des Moines, Ia.—is opening a building material yard with which to furnish its requirements and also do a general retail business. W. A. Spurrier, Jr., and Company are home builders and architects operating in Des Moines. Mr. Ewoldt would like to get in touch with manufacturers of brick and other clay products, supplying that territory.

ALABAMA

The Gadsden (Ala.) Brick Company has installed an electrically-driven brick machine. This is the first step in the development of a plan to completely electrify this plant.

Business is better than it has been for several years, and promises still further improvement, is the report of Thomas Gothard, a brickmaker, of Sheffield, Ala. A new brick machine, an end cutter, and a pug mill, have recently been installed at the plant, as has also a new updraft kiln, with a capacity of 200,000 brick. It is expected that the present plant buildings will be remodeled shortly, and that another kiln will be built. The company is planning to do some advertising in its territory, using "Build with Brick" signs and space in local newspapers to back them up.

CALIFORNIA

The Port Costa (Cal.) Brick Works has secured an order for a million brick to be used in the construction of a new electro-chemical plant at Pittsburg, Cal.

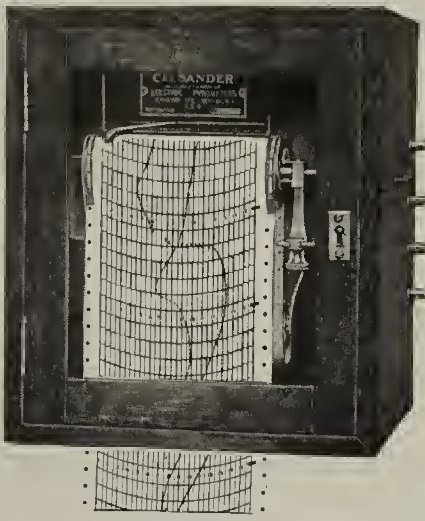
The McNear Brick Agency, San Francisco, Cal., has been awarded a contract for a million brick to be delivered at the site of the new University of California Hospital in that city.

A recent fire on the plant of the Kern County Brick Company of Bakersfield, Cal., completely destroyed the drier and caused damage to adjoining buildings. The loss was estimated at $1,500.

California fire-brick manufacturers are expecting some large orders from the north where the Pacific Coast Steel Company is constructing a number of open-hearth furnaces.

The Ione (Cal.) Fire Brick Company's plant has been in full operation thruout the winter and will continue running, largely on orders now being received from lumber mills all along the Pacific coast.

C. F. Pratt, manager of the Pratt Building Materials



Do You Guess

at the time of day, or—glance at your watch? Of course you use the old reliable timepiece? Yet it is infinitely more difficult to guess temperatures than time. The Sander is a reliable pyrometer, it eliminates the necessity for guessing at heats. Investigate.

The Sander Instrument Co.
136 19th Ave., Irvington, N. J.

DO YOU WANT An Employee? A Position? To Buy Anything?

HAVE YOU For Sale Used Machinery? Land, Plant, or Anything Else?

"Brick and Clay Record" ADVERTISEMENTS Bring Returns.

Flower Pots—
A Profitable Bi-Product

No matter what the nature of your clayworking plant, it is no doubt possible for you to add Flower Pot manufacturing with very little additional outlay.

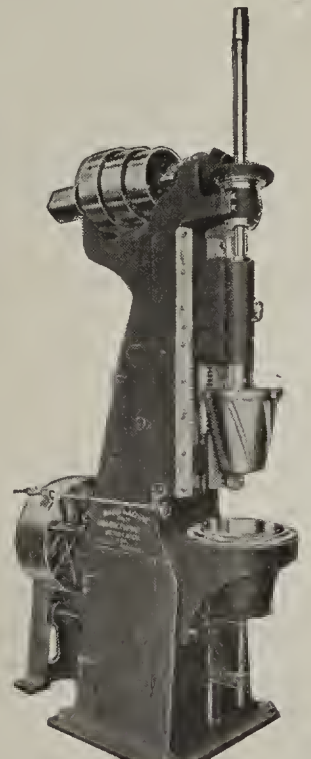
Often you wish you had some way to keep Jim Smith or Jack Jones busy all the time, don't you? Well, here's the solution: put in a

Baird
Flower Pot Machine

Easy to operate, absolutely accurate. Makes any regular size pot desired.

Send us a sample of your clay and let us show you what our machine will do.

Baird
Machine & Mfg. Co.
54-56 Jefferson Ave.
Detroit, Mich.



Company, San Francisco, reports having completed arrangements for the manufacture of a line of interlocking terra-cotta tile, the California sales agency for which has been placed with the Pratt Building Materials Company.

John T. Roberts, manager of the Stockton (Cal.) Fire and Enamel Brick Company, was in San Francisco during the early part of the month looking over the situation. Mr. Roberts reports the demand for common-brick improving, especially in the interior of the state.

Building permits issued in San Francisco, Cal., during the month of February amounted to a total value of $1,356,000 as compared with $947,000 for the month preceding, and with $807,000 for the month of February, 1915. Nearly half of the total permits issued during the past month were for brick buildings.

The plant of the Carnegie Brick and Terra Cotta Company located at Corral Hollow, San Joaquin county, Cal., which was purchased at a trustees's sale recently by Gladding, McBean and Company, of San Francisco, will be dismantled shortly and the machinery removed to the Gladding, McBean and Company's plant at Lincoln, Cal.

COLORADO

The Delta (Colo.) Brick and Tile Company, after several months of idleness, resumed operations recently to take care of the large volume of spring and summer business that is fast developing.

CONNECTICUT

The Clark Brick Company, of Cromwell, Conn., is electrifying its plant.

Berlin (Conn.) brick yards are beginning to reflect the approach of spring by a resumption of operations in some of the yards. J. H. Connley has made a few brick, but weather conditions have been so bad that operations have not as yet been started on a very extensive scale. At the yard of the American Brick Company, the inability to secure sufficient help has delayed the opening of that plant somewhat. The company, under the direction of Superintendent Pickett, is grading the yard for the purpose of laying tracks for cars to convey the clay from the pit, but laborers are so scarce that the work has not progressed very rapidly.

DISTRICT OF COLUMBIA

The West Brothers Brick Company, of Washington, D. C., recently received an order for furnishing more than a half million brick for an addition to the cold storage plant of the Washington market.

The Washington (D. C.) office of the Hydraulic-Press Brick Company has made a shipment of brick to Jaguey Grande, Cuba, which is to be used in the construction of a private residence there. This office also reports the receipt of an order for furnishing brick for a new public school at Raleigh, N. C.

FLORIDA

The Lake County Clay Company, of Okahumpka, Fla., according to its superintendent, H. E. Price, is experiencing great difficulty in obtaining sufficient quantities of cotton bags capable of holding two hundred pounds of clay and strong enough to be used three times or more. The company has been using bags manufactured in Germany and Austria, but on account of the war, have been unable to obtain them, and the supply on hand has been consumed.

IDAHO

Brick manufacturers of Idaho will be invited to joi the Utah Clay Manufacturers' Association. A decision to this effect was announced following a meeting held by the

Give Your Samples A Fair Chance

You select them carefully don't you? Well then pack them safely and attractively and they'll work for you.

H & D Corrugated Fibre Boxes

will deliver brick unbroken and unchipped and save you money, time and trouble besides. They are inexpensive, light, resilient, strong. They come folded flat, are easy to pack and unpack and **they certainly do prevent breakage and chipping.**

Write for sample.

The Hinde & Dauch Paper Co.
Sandusky, Ohio

LEHIGH PORTLAND CEMENT CO.
LEHIGH
ALLENTOWN, PA.-CHICAGO, ILL.

The Cement for Paving Brick Grout

Lehigh is High in Strength, Uniform in Color and Fineness. You Don't Have to Guess with Lehigh.

Specify and Use Lehigh in all Brickwork. Remember the Mortar Joint is an Important Factor in the Wall.

Use Lehigh and Cease to Worry.

It Assures Satisfaction Under All Conditions.

LEHIGH CEMENT

Cement Grout for Permanence

executive committee of the association on February 28 at Salt Lake City.

The Smedley Brick Company, according to reports received from Pocatello, Idaho, will completely overhaul its plant in the spring, when new machinery will be installed.

ILLINOIS

The location of the Haeger Brick and Tile Company's offices has been changed from Elgin to Dundee, Ill.

INDIANA

Due to the encouraging spring outlook, the plant of the Summitville Drain Tile Company of Summitville, Ind., has resumed operations after being closed several weeks.

A. E. Davis, Indianapolis representative of the Western Brick Company, of Danville, Ill., states that the outlook for a good business this year is ten times better today than it was a year ago.

Terre Haute, Ind., is to have another clay plant shortly. The Bennett Brick Company of that city has been incorporated with a capital stock of $5,000. The following directors have been elected: Edward Bennett, Anna Bennett, Mary E. Bennett and Charles Bennett.

The Montezuma (Ind.) Brick Company has started its plant with a full working force. This plant has been closed most of the winter while extensive repairs were being made. A sufficient number of orders is now on hand to insure capacity operations for at least two months.

Plans that have been on the boards of architects for several months are now being let, according to J. W. Van Wert, manager of the building materials department of the A. B. Meyer Company, Indianapolis, Ind. Several large jobs are in prospect, which will require brick and hollow-tile.

The Ris-Clay Brick Company of Michigan City, Ind., has been reorganized. The new officers elected are: W. J. Riley, president; C. W. Hotchkiss, vice-president and Arthur Roeske, secretary and general manager. Mr. Roeske recently purchased a third interest in the company from W. B. Hutchinson.

The plants of the Veedersburg Brick Company, at Veedersburg and Martinsville, Ind., are now operating at capacity, after having been closed for the greater part of the winter. Stocks of common-brick in Indiana are rather short, according to C. A. Pritchard, manager of the Indianapolis office of the company, and for this reason it is believed that higher prices will prevail this year than for some time past. Common-brick at that point has advanced fifty cents per thousand already, and with an active building season in prospect much higher levels are anticipated.

IOWA

A quantity of clay was recently discovered by W. R. Blackledge on his farm at Bangor, Ia. Steps are being taken to develop the deposit.

KANSAS

The plant of the Tyro (Kan.) Shale Brick Company was recently sold to C. A. Noll, of Wichita, Kan. Mr. Noll is also president of the Howard (Kan.) Brick Company.

KENTUCKY

Some indication of the amount of future business that will soon develop into orders for the brickmakers of Louisville, is shown in the February report of the city building inspector. A gain of two hundred per cent is noted in the value of building permits taken out during

"A Pyrometer with a Conscience"

IT IS THE
Beighlee

A Big Impressive Instrument
—made so sturdily that it resists rough handling.
—made so perfectly that it records perfectly year in, year out.
—equipped with a compensating device that compels your serious attention.
—equipped with the largest recording dial in existence (in itself a guarantee against errors, for a small dial CANNOT record accurately).
We say it has a conscience—we mean it. We go further—we say it is the best in the world —we can prove it.

Beighlee Electric Company, Cleveland, O.
Gibb Instrument Co., Highland Bldg., Pittsburgh, Pa.
Representative in Pennsylvania and Virginia
Herman A. Holz, Hudson Terminal Bldg., New York City
Representative in New England States

BALDWIN

You want a reliable, economical locomotive for service about your plant. Investigate the Baldwin gasoline locomotive.

These locomotives are reliable, because they are correctly designed and built. They are economical, because they consume no fuel while standing idle.

Record No. 74, which is yours for the asking, tells all about them.

THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA, PA., U. S. A.

the past month when compared to the same period a year ago.

The Bond (Ky.) Reduction Company, which in the past has been engaged in the shipment of fire and potters' clays, has been reorganized to manufacture tile and fire brick. C. E. Kennedy is president of the new company, and B. A. Bounds is manager.

Plants of the Louisville (Ky.) clay products manufacturers, with one or two exceptions, are in full operation. The winter has been a moderate one and those who have had orders on hand have been operating on full time. Much small building work is in progress and in prospect, and this will provide orders for the smaller manufacturers.

At Wickliffe, Ky., Thomas Connors has purchased the plant of the Wickliffe Clay Products Company, and will add to it machinery which he is moving from his former plant at Columbus, Ky. Improvements and additions will bring the plant up to a high state of efficiency. Draintile and pottery will be manufactured. The plant lies near the Ohio river and shipping facilities will be excellent.

The Kentucky Railroad Commission has entered an order in the case of Charles Taylor and Sons against the Chesapeake and Ohio Railroad, requiring that carrier to make a rate of fifty-three cents a ton on fire-brick between Taylor and Russell, Ky. Several other complaints are before the commission concerning rates on brick and other building materials. The R. B. Taylor Company, Louisville, is a complainant in one case which relates to joint rates on the Southern and the Louisville and Nashville Railways. The commission cannot now regulate rates over two railways. There is, however, a measure before the state legislature which would clothe the commission with such powers.

Citizens of Louisville, Ky., are getting new and favorable impressions of the effectiveness of terra-cotta as a decorative material thru the Bankers' Realty Company building at Fourth and Market streets, and the Speed buildings on Fourth street, between Walnut and Chestnut streets. The latter, especially, is taking shape in a most satisfactory way. This job was furnished by the Atlantic Terra Cotta Company, and sold thru the Tyler Building Supply Company. It was a special order, the material being a cream, matt-finish tile, giving a very beautiful finish and texture.

MARYLAND

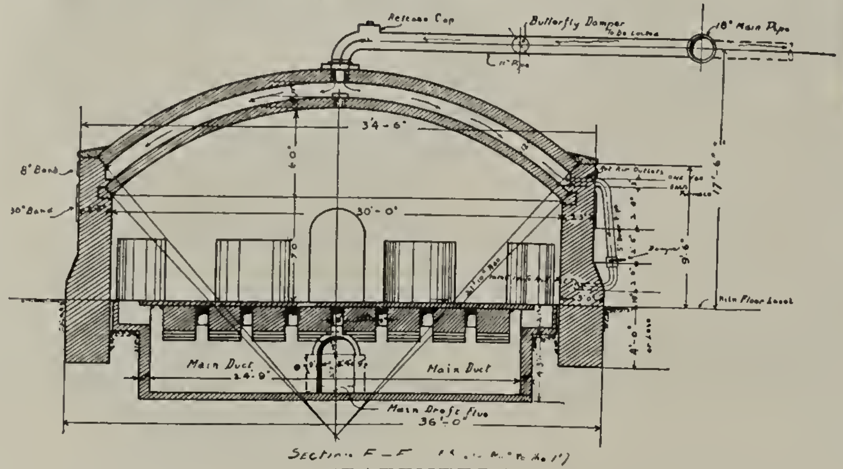
The Big Savage Brick Company of Cumberland, Md., is considering the building of a new plant that will double its capacity.

MASSACHUSETTS

The Marcy Lumber Company, of Palmer, Mass., is planning to operate a brickyard at West Brimfield, Mass., during the coming season. The yard is now being put in shape.

The New England Brick Company, of Boston, Mass., has orders on hand to furnish "Harvard reds" for a number of large residences which are being erected in the vicinity of Fresh Pond, Cambridge, on what was formerly the estate of Professor Gray, of Harvard University. The houses vary in value from fifteen thousand to thirty thousand dollars. The "Harvards" have long been the standard material for the construction of the university buildings, and it is to retain the similarity that the archi-

McMANIGAL'S SUPER HEATING SYSTEM



(PATENTED.)

THE DOUBLE CROWN EARNS

A second crown is built over the kiln, a current of air is blown between the crowns and down into the fireboxes.

It preserves the fire brick crown from rain and snow, and also provides a method of collecting the enormous amount of radiated heat and utilizing it.

Practically a perfect control of the fires is obtained, and a great saving in fuel and time accomplished.

It is burning paving block in 5½ days on one plant.

Better get in touch with us at once.

The McManigal Grateless Furnace Company
LOGAN, OHIO

It can be built on Your Present Kilns

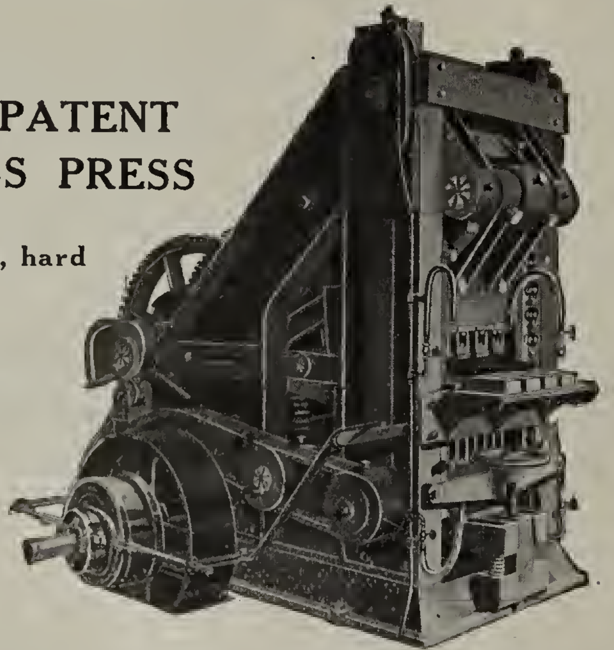
DRY PRESSED FIRE BRICK

Made on a

GRATH PATENT PEERLESS PRESS

will be dense, hard and tough.

They will be better able to withstand abrasion in service and in handling.



No pressure arms, gears or frames have ever been known to break on our presses.

Send for information now.

Illinois Supply & Construction Co.
ST. LOUIS, MO.

tects on the new houses specified the New England Company's product.

MICHIGAN

The Mamer Brick Company of Benton Harbor, Mich. has increased its capital stock from $40,000 to $60,000.

Detroit's newest and largest moving picture theater, to be known as the "Madison," and erected at Broadway and Grand Circus Park, will be of brick construction.

The Flint (Mich.) City Council recently awarded a contract for paving brick to be divided equally between the Carlyle Paving Brick Company of Portsmouth, Ohio, and J. P. Burroughs and Son. Each contract calls for about 3,965 square yards of paving brick.

James Couzens, formerly general manager of the Ford Motor Company and president of the Highland Park State Bank, Detroit, Mich., announces that he will erect an eighteen-story office building at Fort and Shelby streets which will be of brick faced with terra-cotta. Work will start this spring and the building completed by April 1, 1917.

Never in the history of Detroit have there been so many new subdivisions put on the market as now, and never were the architects and contractors so busy on plans for spring and summer. Thousands of workmen are buying these new lots, and several architects have stated that they have been instructed to design brick houses and apartment buildings.

On February 1 the price for common-brick in Detroit advanced from $7.50 to $8 per thousand, and on March 1, there was another fifty cent advance, making the present price $8.50. This advance was made by all of the common-brick manufacturers operating in that city. The $8.50 price is destined to remain thruout the ensuing year. The advance is not having any material effect on the demand for common-brick which is just as active as it has been for some months past.

According to local prophets, if the weather is unfavorable in Detroit this spring, there will be plenty of common-brick to supply the market, but if the weather is fine, there may be a shortage. Such a shortage, however, would probably only last until June 1, as Detroit brick makers are increasing the capacity of their plants by 65,000,000 all told. There is hardly a clay plant near the city that is not doing something towards improving its equipment. John S. Haggerty will increase his plant by 20,000,000; George H. Clippert and Brothers Brick Company, 15,000,000; Mercier-Bryan-Larkins Brick Company, 15,000,000 and William Clippert, 10,000,000.

MISSOURI

The Superior Clay Company, of Clayton, Mo., has been organized for the purpose of mining and selling fire clays. The incorporators of this company are: John F. McDermott, J. C. Pratt and R. B. Gibson.

J. Broering, superintendent of the Hydraulic-Press Brick Company, of Kansas City, Mo., reports the year 1915 as having been a busy one. Mr. Broering looks forward to a fifty per cent increase in sales during 1916.

The Supreme Fire Clay Company of St. Louis, Mo., is a new corporation with a capital stock of $20,000. The incorporators are: Jacob Leonhardt, Julian Simon and D. D. O'Keefe. The company will mine and sell fire-clay.

The Denny-Renton Clay and Coal Company's plant at Tacoma, Wash., is now under the supervision of Oscar Nuhn. Twenty thousand square feet of land have recently

HETTRICK BELTING

of red stitched canvas construction is the best possible belt for

Elevators, Conveyors and Power Transmission

All possible stretch is removed, it is oil processed and red dressing applied—
Then it is cured—before it is sold to you as

THE BEST BELT FOR CLAY PLANTS

HETTRICK CANVAS BELTING
BEATS THEM ALL

HETTRICK BROS. CO.
TOLEDO, OHIO

You won't have to worry about competition if you treat your clay with

R. H. Precipitated Carbonate of Barytes

You can safely guarantee that your brick will be

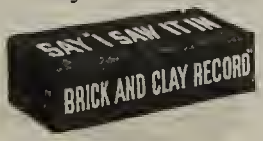
Scum-Proof

You can get a higher price and influence architects to specify your product because Efflorescence is prevented absolutely.

But insist on the R. H. BRAND—it's dependable.

We have a complete line of high grade chemicals for the clay industry.

The Roessler & Hasslacher Chemical Company
100 William Street New York
Chicago, Ill. East Liverpool, O. St. Louis, Mo.
Kansas City, Mo. Philadelphia, Pa. Boston, Mass.
New Orleans, La.



been leased by this company for an extension of the plant.

NEW JERSEY

At a recent meeting of the property owners on Main street, Talmage avenue and Shunpike, Plainfield, N. J., it was unanimously agreed to pave those thorofares permanently. With one exception, every one of the fifty or more property owners was in favor of vitrified brick.

The Standard Brick Company has been incorporated in Trenton, N. J., with a capital stock of $125,000, for the purpose of manufacturing brick. The incorporators of this concern are: A. J. Barrall, of Syracuse; G. C. Roth, of East Orange, and H. S. Smith, of Summit, N. J.

The Mercer Clay Products Company is a new concern of Trenton, N. J., that has been incorporated to mine and prepare clay for the market and manufacture clay products. Charles H. Rue and William D. Hamilton, of Trenton; P. C. Boving, of Philadelphia, Pa., and L. G. Bachert, of New London, Conn., are the incorporators.

The old plant of the Trenton (N. J.) Fire Brick Company has been sold to the Sneyd Enameled Brick Company, a new corporation. The deal was negotiated through Malcomb Buchanan representing Charles A. Pope and others who secured possession of the plant a year ago under foreclosure proceedings. The price paid was $30,000. The plant includes a brick building with drying sheds adjoining and a tract of land 600 feet long by 300 feet deep. The plant is well adapted to the manufacture of enameled brick.

NEW YORK

The United States Terra Cotta Company, of Harvey, N. Y., has been organized with a capital stock of $50,000 to manufacture and sell clay products.

The Independent White Sand Company has been incorporated with a capital stock of $100,000, to mine and sell clay and feldspar at Delaware, N. Y.

The Seneca Clay Company of Buffalo, N. Y., is a new corporation with a capital stock of $50,000. The incorporators are: W. E. Bray and A. T. Beasley of Buffalo, and T. R. O'Brien, of Lockport.

The Raritan Clay Products Company is a new concern incorporated with a capital stock of $70,000, to manufacture and sell clay products in Bronx Borough, N. Y. The incorporators are: W. Gustavus Demarest, Alex J. Fraser and Chester W. Cuthell.

NORTH CAROLINA.

The two plants of the Fowler and Rand Brick Company located at Durham and Hillsboro, N. C., have been sold at public auction by the receivers, J. W. Smith and R. P. Reade.

OHIO

The Berlin Heights (Ohio) Brick and Tile Company has been sold to the Berlin Heights Banking Company. The plant will be put in operation shortly.

The Canton (Ohio) Clay Products Company has been organized by Charles A. Bourgeois and others, with a capital stock of $75,000.

The Shorey-Willis Brick and Supply Company have removed their offices in Cincinnati, Ohio, to the Union Trust Building.

It is rumored that the Cuyahoga Brick and Shale Company of Cleveland, Ohio, has purchased a fourteen acre tract of land in old Brooklyn for the sum of $15,000.

The contract for the brick required in the addition to

Pottery Possibilities
in vicinity of
MACON, GEORGIA

Book containing geological report by T. Poole Maynard, Ph. D., Consulting Geologist, and physical tests by Dr. Arthur S. Watts, of Ohio State University, on kaolins, feldspars, ball clays, etc., in vicinity of Macon, Georgia, mailed on request.

Report has map showing location of deposits, and full information as to freight rates, fuel, etc.

J. M. MALLORY
Industrial Agent
Central of Georgia Railway
231 W. Broad St
Savannah, Georgia

THWING HIGH RESISTANCE MULTIPLE RECORD PYROMETERS

Never Sleep

If the burner knows that his work is being

Recorded in Ink

every few minutes, he will stay On the Job.

Multiple Recorders reduce the cost of installation.

How Many Kilns Have You?

Thwing Instrument Company
437 North Fifth Street
Philadelphia

the Hotel Hollenden has just been awarded to the Cleveland Brick Sales Company.

The Shawnee Flash Brick Company of Columbus, Ohio, under the direction of Receiver Samuel D. Downey, will be sold if the required two-thirds of the appraised value can be obtained.

Dr. H. E. Kilgus was elected president, and I. T. Kaul, secretary and treasurer of the Kaul Clay Manufacturing Company, of Toronto, Ohio, at the annual meeting of the company, held recently.

The Columbus Tile and Fireplace Company has been incorporated with a capital stock of $15,000 by H. L. Harbison, R. E. Westfall, L. D. Gaddis, N. Bales and Hilda Shetler. Offices will be maintained in Columbus, Ohio.

At a meeting of the Lawrence county commissioners, held recently at Ironton, Ohio, with regard to the paving of Hanging Rock road, it was practically decided that brick would be used.

The Cuyahoga Brick and Shale Company, Cleveland, Ohio, has installed a new tile machine which will give that plant a capacity of two hundred and seventy-five tons of tile a day—double the former capacity.

A considerable amount of brick paving is to be laid on the streets of Portsmouth, Ohio, during the coming spring, the brick for which will be furnished by the Peebles Brick Company and the Carlyle Brick Company, both of that city.

Twelve acres of land were recently purchased by the American Building Brick Company of Cleveland, Ohio, for a sum of $16,000. Most of the land, which immediately adjoins the company's present tract, will be used to extend the pit.

A new builders' supply company in Cleveland, Ohio, is the Harris-Murray Company, which has taken offices in the Garfield Building. Both Chester W. Harris and Gordon Murray are widely known to brick, hollow-tile and other building material manufacturers and dealers in northern Ohio.

Another firm to report higher prices for common-brick is the Barkwill Brick Company, Cleveland, Ohio. A higher price does not seem to have much effect on the demand, according to E. J. McGettigan, sales manager. The Barkwill company has added new equipment to its Pearl Road plant, which will increase its capacity to 120,000 brick a day.

According to Robert C. Mitchell, general manager of the Farr Brick Company, Cleveland, Ohio, the demand for common-brick is so great there is danger of a shortage. Mr. Mitchell reports an advance in price of one dollar a thousand. The company recently placed an order for 10,000,000 brick, to be made by another company, in order to keep its stock in good shape.

The Hanover (Ohio) Brick Company, which has been operated under a receivership for the past two years, has been purchased by the bondholders, and repairs are being made that will make it possible to reopen the plant shortly. E. F. Grimsley, of Zanesville, who has been superintendent of the plant during the receivership, will be retained in that position.

The city of Zanesville (Ohio) is preparing to spend more than $100,000 in paving its streets, mostly with brick. City Engineer Carl R. Spencer has submitted estimates for seventeen separate improvements, for which the city's share will be $97,000. Indications are that the council will approve the majority of these proposed pavements, so

A New Sewer Pipe Truck
that is built in three different sizes:
No. 1. To handle 18"-20" and 24" pipe.
No. 2. To handle 27" and 30" pipe.
No. 3. To handle 33" and 36" pipe.
This Truck will be manufactured with the same care and skill shown in our Sewer Pipe Presses, Wheelbarrows, Dry Pans, etc. Send at once for descriptive matter.
The Toronto Foundry & Machine Co.
Toronto, Ohio

Heraeus LeChatelier
Pyrometers
"The Ultimate Pyrometer"
Are designed and constructed to give lasting and uninterrupted service. Their higher first cost is many times offset by their lower maintenance cost.
180 Kilns
have been equipped with Heraeus Pyrometers in the past year. Let us refer you to some who have them.
Send for New Catalogue
Charles Engelhard
30 Church Street
NEW YORK, N. Y.

BRISTOL'S HIGH RESISTANCE ELECTRIC PYROMETERS

EQUIPPED with high grade Weston milli-voltmeter movements with platinum platinum-rhodium couples for temperatures up to 3000 deg. F. The milli-voltmeter movement is of **pivot jewel-bearing type** which is comparatively rugged and especially adapted and used extensively to control kiln temperatures.

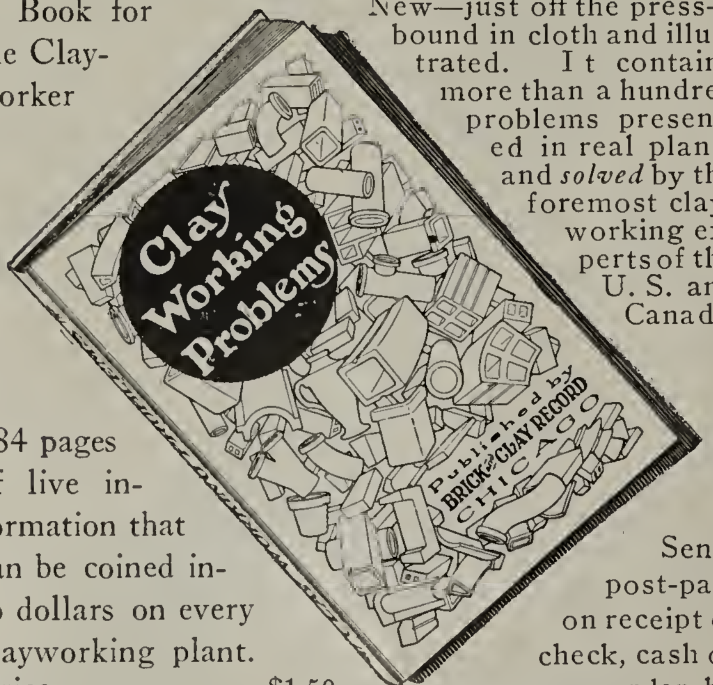
Write for Catalog 1400

THE BRISTOL CO., WATERBURY, CONN.

BRANCH OFFICES BOSTON CHICAGO PITTSBURGH NEW YORK SAN FRANCISCO

101 Questions Answered

A Book for the Clay-worker


Clay Working Problems
Published by BRICK & CLAY RECORD CHICAGO

New—just off the press—bound in cloth and illustrated. It contains more than a hundred problems presented in real plants and *solved* by the foremost clay-working experts of the U. S. and Canada.

184 pages of live information that can be coined into dollars on every clayworking plant.

Price $1.50

Sent post-paid on receipt of check, cash or money-order by

Brick and Clay Record

445 Plymouth Court CHICAGO

that the work can proceed as soon as weather conditions permit.

A deal, whereby the capacity of the Barkwill Brick Company of Cleveland, O., will be increased to over 72,000,000 common-brick a year and 200 tons of hollow-tile a day, was recently brought to light when that company purchased the plant of the Standard Brick Company at South Brooklyn, Ohio, for a consideration of more than $100,000. Twenty-six acres of land are included in the purchase.

The Anders Shale Brick Company, of Cincinnati, Ohio, is one of the few local plants that have continued in operation all winter. With the exception of about three weeks during the coldest weather, operations at this plant have been proceeding without interruption, while deliveries have been made constantly. A large job, requiring about 300,000 brick, has kept the plant busy a large part of the time. In addition to an increasing activity in building, good common-brick are also in demand for sewer work. A new down-draft kiln is now being completed at the plant, which will increase its capacity.

OKLAHOMA

The Cleveland (Okla.) Brick Company has been incorporated by G. W. Sutton, J. B. Myers, I. D. Gould, Howard Hanna and others, with a capital stock of $75,000.

OREGON

The Warrenton (Ore.) Clay Company, a recently organized firm with a capital stock of $125,000, will begin at once the erection of a plant for the manufacture of sewer-pipe, drain-tile, hollow building tile and common-brick. The machinery will be housed in a building measuring 80x120 ft., three and a half stories high. Additional buildings will be added later as needed. The plant stands on a tract of fifteen acres with good rail and water connections.

PENNSYLVANIA

The Corry (Pa.) Brick and Tile Company has installed a new ten-track drier, and added to its kiln battery.

The Kier Fire Brick Company will spend $5,000 this spring in improving its plant at Cladder Station, near Altoona, Pa.

The James Gardiner, Jr., Brick Company, of Lockport, Pa., has started to rebuild its plant that was destroyed by fire a few weeks ago.

Walter G. Roland, a well known brick manufacturer of Reading, Pa., recently purchased the property and plant of the Enamel Brick Company located at Oaks, Montgomery county, Pa.

The Youngstown Clay Products Company of Volant, Pa., announces that it will enlarge its plant during the coming summer. Additional kilns and drier space will be added to double the present capacity.

The Harbison-Walker Refractories Company of Pittsburgh, Pa., denies with emphasis rumors circulated to the effect that plans are being considered for the consolidation of that company with the National Fireproofing Company.

Sixty members of the chemistry class of Bucknell University, headed by Professor Owens, recently spent two hours on the plant of the Watsontown (Pa.) Brick Company, watching the process of brickmaking from the pit to the loading platform.

At a recent meeting of the Jarden Brick Company, Philadelphia, held in the offices of the company in the Land

Title Building, E. R. Winter was elected to membership on the board of directors, to succeed the late Peter A. B. Widener.

The American Tile Company, of Wampum, Pa., proposes to enlarge its plant and increase its capacity before the rush of spring business. At the annual meeting of the company, held recently, the following officers were elected: President, J. S. Myers; general manager, J. F. Froyn and general superintendent, F. B. Myers.

The outlook for building in the Pittsburgh (Pa.) district is sufficiently bright to warrant a number of improvements that are now being made on the clay plants located in that vicinity. The various municipal paving bond issues have been so numerous and arranged with so little difficulty, that the paving-brick men anticipate a large business during the coming months.

Robert H. Remmey, president and treasurer of Richard C. Remmey Son and Company of Philadelphia, Pa., writes us that his plant is running at full capacity and that, while the cost of common labor has been advanced, the increased selling price that has been received for his product has more than made up the difference. A new kiln has been built and other plant improvements are contemplated.

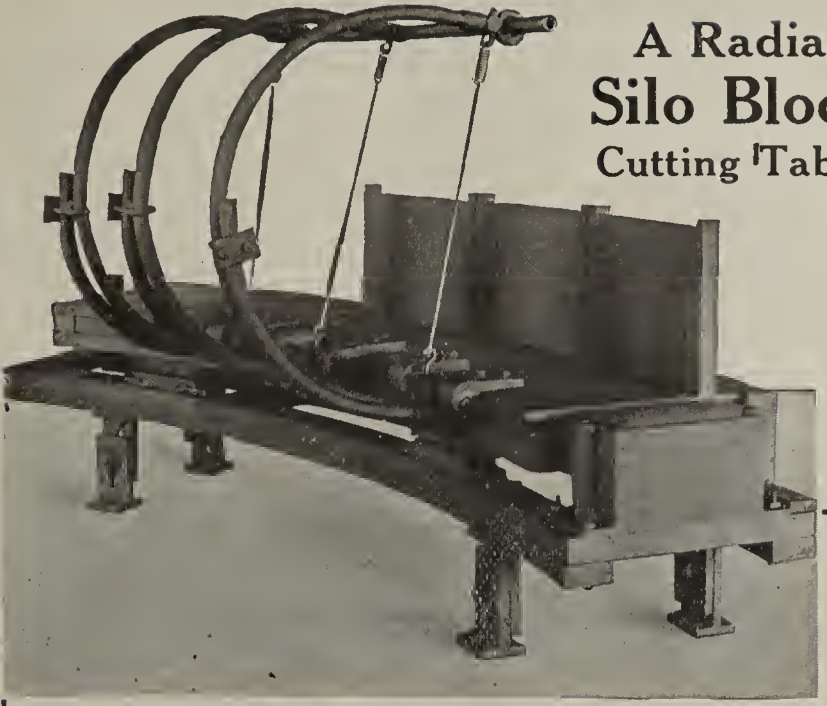
Clyde C. Murray, of the Reynoldsville (Pa.) Brick and Tile Company, reports that business is showing a marked improvement, except for the car shortage situation, which is becoming serious. The company has recently developed a very high grade, smooth textured, red face-brick, with a full range of colors. A new office building has been added to the plant, in which brick was used exclusively. At the annual meeting of the company held recently, Mr. Murray was elected president; Charles G. O'Donnell, vice-president; Walter I. Murray, secretary, and Henry Herpel, treasurer.

Bookings are very good, but difficulty is being experienced in making shipments on account of a car shortage, writes T. P. Cuthbert, general manager of the Fallston Fire Clay Company, of Pittsburgh, Pa. As announced in the February 1 issue of "Brick and Clay Record," this company recently purchased the plant of the Face and Fire Brick Company, of Eastvale, Pa. However, a twin plant has been added to the Fallston company's original plant, at Fallston, Pa., which raises its capacity to twenty-eight million brick a year, twenty million of which will be smooth "iron spots," while the remaining eight million will consist of rough-texture face-brick. The company has recently established some new agencies.

A number of improvements have been made during the past few months at the plants of the General Refractories Company. New steel bins for the storage of crushed ganister rock, and five large kilns have been built at the Claysburg (Pa.) plant. The Wynn Works, at West Decatur, Pa., have also been the scene of numerous alterations. It is more than probable that the output of the Karthaus (Pa.) plant will be doubled within the next two or three months. D. Ross Wynn, general manager of the company, reports that business is exceedingly good, and that the company has all of the orders it can conveniently handle. In the office at Decatur, John A. Ross has been appointed purchasing agent, while E. M. France has been placed in charge of the order department.

SOUTH DAKOTA

If we could fill all of the orders that are being sent us we would double last year's output, is the report of S. C.



A Radial
Silo Block
Cutting Table

The Farmers Are Building Clay Tile Silos

You hollow tile men! You can't afford to serve his needs—using old-time machinery or hand methods.

Hundreds of silos will be built—make the blocks on this cutter with a profit for your firm.

Use it in your silo season, store it in the off season—but you simply can't make as much profit without it as with it. One man runs it.

WRITE US TODAY—NOW

CRAWFORD & McCRIMMON CO.
Brazil, Indiana

Do You Have—

over-burned ware in top of kiln, and under-burned on bottom?

Does your ware crack, soften, and crush in bottom of kiln from water-smoking?

The Improved Hook Patent Up and Down Draft System

entirely overcomes these difficulties, as it is so arranged that the direct heat can be applied to top and bottom at the same time. This causes the ware to be burned with a uniform hardness in all parts of kiln.

The following is a letter in further proof of our claims:

Attercliffe Sta., Ont., Dec. 29, 1915.

Ohio Kiln Co., Vigo, Ohio.

Gentlemen: We are certainly much pleased with the 26-ft. Up and Down Draft Kiln we built last fall from your plans. We burned four kilns of drain tile, the average time being close to 36 hours from start to finish, and we consumed 9 ton of coal on each kiln. What pleased us most was that they were all hard as rocks.

The burning was done by two young fellows who had never fired a kiln of any kind before, but by following your firing instructions they had no difficulty in making a perfect success of each burn.

Yours truly,
Attercliffe Standard Brick & Tile Co.

The evidence is convincing. We are doing it for others, and can do it for you. Let us prove our claims. Mr. C. Hook is associated with Ohio Kiln Co. only, and when you do business with us, we assure you that you will receive his personal attention as well as the benefit of his 28 years' experience in designing of kilns, and the actual manufacturing of clay products.

Do not be deceived, insist on having his latest patent kiln.

Sold only by

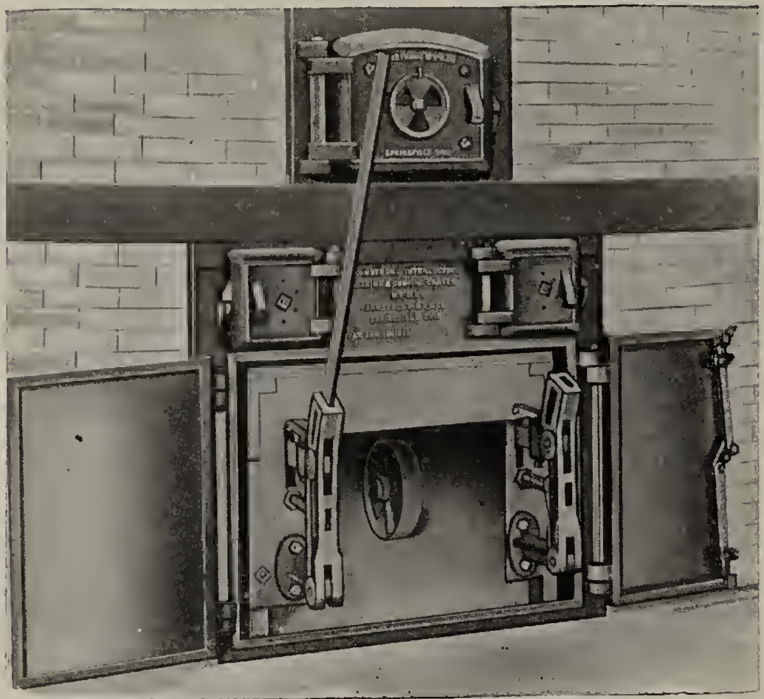
Ohio Kiln Company, Vigo, Ohio

Armstrong Kiln Grates

Portable—Interlocking—Self-Contained
Shaking—Dumping

We will ship our Standard Interlocking Kiln Grate to any clay plant anywhere, install it at our own expense—if it is not satisfactory or does not give better service than any other kiln grate, we will remove it—and it won't cost you one cent.

It Will Positively Reduce Your Burning Costs.



We want to tell you more about these grates.

The Armstrong Manufacturing Co., Springfield, Ohio

POSTERETTES

200,000 of the "Build with Brick" posterettes have been used by brickmakers throughout the country. As many pieces of mail and express matter have carried the "Build with Brick" slogan to a vast army of prospective homebuilders.

Here is the second edition—the stamp advertising paving-brick. It tells a story that carries a moral—and that moral means better business for the men who make paving-brick.

How about using some of them—now?

Printed in THREE colors

Gummed and ready to stick on your letters, envelopes and packages.

$1.50 per thousand postpaid

Send your orders to

BRICK AND CLAY RECORD
445 PLYMOUTH COURT CHICAGO

Reck, of the Rex Shale Brick Company, Rapid City, S. D. The company is steadily expanding its kiln space, using scove kilns for burning dry-press common-brick. The plant has just opened up for the season's run, and expects to make a better product than ever before.

TENNESSEE

The commissioners of Jackson, Tenn., who for some time have been debating as to the material to be used for a $100,000 street improvement, have recommended vitrified brick.

Owing to high water on the Tennessee River, J. W. Wells Brick Company's plant at Chattanooga, Tenn., has been idle for the past six weeks during which time it has been given a general overhauling. Full time operations, however, are now in force.

The plant of the Southern Brick and Tile Company, of Gilmore, Tenn., after a long period of idleness, is being overhauled, and will be put in operation shortly under the management of W. F. Houck, an experienced brick manufacturer of Bluefield, W. Va.

B. R. Shepherd, traffic manager of the Chattanooga (Tenn.) Sewer Pipe and Fire Brick Company, attended a hearing on sewer-pipe freight rates, held March 5 at Tampa, Fla. Shipping rates from Chattanooga to Tampa were involved.

Lance Fox, proprietor of a brick and tile plant at Obion, Tenn., reports that his plant has just had a thoro overhauling, and that a new stack has been added to the boiler room. In addition to the clay plant, Mr. Fox owns a farm. In common with a large number of farm owners in many parts of the country, he has had to go thru the experience of having a fire, which, in his case, did three thousand dollars' worth of damage, destroying a silo and barn. When new buildings appear on this farm, burned clay materials will figure largely in their construction.

TEXAS

The Commonsense Tile Company of El Paso, Tex., is a new corporation with a capital stock of $10,000. The incorporators are: T. L. Marrin, Benjamin Franklin and Lucy A. Watts.

The fact that the Wichita Falls (Tex.) Brick and Tile Company shipped during the first seven days in March, a total of one million brick, suggests the improvement in demand in the Lone State State. This company has three well equipped plants located on the edge of town.

New machinery is being installed at the plant of the Emmett Brick and Tile Company, Gonzales, Tex., preparatory to resuming operations this month. This company was recently incorporated by O. B. Robertson, R. L. Robertson and W. T. Miller, with a capital stock of $30,000.

B. E. Novell, president of the Bay City (Tex.) Brick and Tile Company, states that the demand for brick in his territory is improving. This company's plant has been completely overhauled, and a large crude oil engine installed, to replace an old steam engine. New kilns and a drier have also recently been added. James W. Rugeley is now secretary and treasurer of the company.

UTAH

One of the largest orders for drain-tile ever placed in this country was recently given the Utah Fire Clay Company, of Salt Lake City, Utah, by the Delta Land and

Water Company. About one hundred and fifty miles of tile are to be laid, to reclaim 7,000 acres of land.

VIRGINIA

The New Era Brick Company is a new corporation at Richmond, Va., that has been capitalized at $60,000. Ford M. Booth, of Richmond, has been elected president, and James E. Cuthbert, of Petersburgh, secy. and treas.

John T. Watson of the Watson-Fitzgerald Corporation, Danville, Va., writes that prospects for a good business this year are more promising than for the past two years. Some changes in the clay handling and drying equipment have been made at this plant which, in addition to its line of commons, is now manufacturing face-brick. The company is also considering plans for taking on new lines of ware, among these being drain-tile, hollow-tile and conduits.

WEST VIRGINIA

The West Virginia Paving and Pressed Brick Company of Huntingburg, W. Va., will add several kilns to its present battery.

With the entire output of his building-brick plant sold for 1916, Dennis Leahy of Pence Springs, W. Va., is contemplating the erection of a large addition for the manufacturing of paving-brick.

The Richlands (W. Va.) Brick Corporation has installed a steam shovel and locomotive at its plant to take care of the large brick orders that have been recently received.

WISCONSIN

The Vesper (Wis.) Brick and Tile Company reports a slow demand for brick, but a steady inquiry on drain-tile. A new kiln, engine and crusher have recently been installed at this plant, and the next few months will see the further addition of a new storage shed and a boiler. Improved machinery and manufacturing methods are producing a better product at this plant, which is endeavoring to increase its sales by advertising, both direct and newspaper. The company reports that it has just completed the shipments on one order of tile which amounted to twenty-two carloads.

The Acme Brick and Sand Company, of Milwaukee, Wis., reports a good business, and that it is looking for a very busy year during 1916. This company's plant has been operating every day thruout the past winter, averaging a daily production of 50,000 sand-lime brick. The company reports that there are about ten million second-hand brick being dumped on the market in Milwaukee from several buildings which are being wrecked, and that until these brick are sold or otherwise disposed of, the demand for good clay brick will not reach a high point. As a result of the market being clogged with these second-hand brick, prices are not as high as they might be, considering the time of the year.

Minneapolis Plans Large Common Brick Plant

A common-brick plant, costing a half million dollars, and having a daily capacity of 300,000 brick, will be in operation about June 1, according to present plans of the Minneapolis (Minn.) Clay Brick Company.

The excellent market that Minneapolis offers for the sale of common-brick has been an attractive inducement for local capitalists, and has resulted in the reorganization of the Minneapolis Clay Brick Company to include several smaller plants located near the city. The new plant will be entirely fireproof, and will have two outlets by rail.

BUFFALO
450 Rooms 450 Baths

DETROIT
800 Rooms 800 Baths
200 room addition building

CLEVELAND
1000 Rooms 1000 Baths

For EVERY Guest

THE extra-good variety of hotel service which we've developed at Hotels Statler is for *every* guest, no matter how little or how much he spends.

Yes, it's for the non-tipper, too.

The patron of a hotel has just as much right to expect *courtesy* and a *gracious, thoughtful service* from employees as he has to expect his change.

He gets it every time at a Hotel Statler—or as nearly every time as humanly-rendered service can make it.

Every—*every*—Hotel Statler room has private bath; outside light and air; circulating ice-water; writing desk with plenty of stationery, etc.; local and long distance telephones; pin-cushion, with needles, thread, buttons, etc.; candle for a low night-light, and numerous other unusual conveniences. Morning paper delivered free to every guest-room.

Hotels Statler lobbies and public rooms are cheerful, luxurious, and comfortable.

HOTELS STATLER
BUFFALO - CLEVELAND - DETROIT
Rates from $1.50 Per Day

Your Ware Is As Good As You Make It!

To make a merchantable class of ware it devolves upon you to perfect each single phase of the manufacture—from the selection of the clays to the sorting of the finished product.

The correct measuring and mixing of two or more raw clays is of tremendous importance.

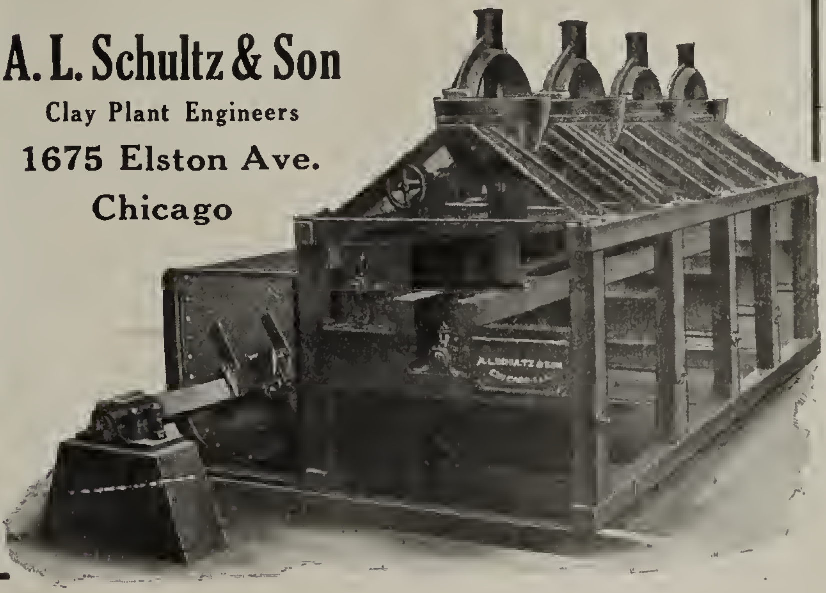
Financial success or financial failure depends upon the ability of your men or machines to standardize the batch.

To depend on your men to measure, to guess, to mix with shovel—or slide gate and chute is to have the batch run wild.

A dependable machine is your only alternative, and that machine is the Schultz proportioner—it measures, mixes and tempers. Set it and leave it. It does its work well.

Get details from

A. L. Schultz & Son
Clay Plant Engineers
1675 Elston Ave.
Chicago



SAY "I SAW IT IN BRICK AND CLAY RECORD"

SIXTY-FIVE

Hook Kiln Installations

in this North West Section of Ohio

We didn't sell them all in one day's time.

After we had sold and installed the first few installations to plants in this section, we found the balance of our prospective customers delaying their purchase.

Because they wanted to see if their nearest neighbor would be successful.

Invariably they did reduce their burning expense and time with the net result that there are today sixty-five plants using the hook kiln in this one section.

No better endorsement could be given. Ask now for complete information.

THE HOOK PATENT KILN CO.
VIGO, OHIO
Canadian Office: 250 Dufferin St., Toronto, Can.
We have sold Hook Kilns all over the Central West.

POTTERY NOTES

A Resume of the Activities of the Potters and Some Mention of Their Plans for the Future

Reports are current that a number of additional kilns will be erected by eastern Ohio pottery manufacturers this year. At Carrollton, Ohio, the Carrollton Pottery Company will increase its kiln capacity, while the Albright China Company of the same city will start the erection of two additional kilns within the next few weeks. The pottery interests at Sebring, Ohio, are planning extensions to capacity, while the erection of a new plant in that district is being contemplated.

At the annual convention of the National Brotherhood of Operative Potters this year in Atlantic City, N. J., the organization will have up for consideration the revision of the sanitary wage scale. Proposals for changes are now being worked out by the various locals interested in that branch of the pottery business. Last year the general wage scale was up for consideration, and at a joint wage conference, a two-year agreement was adopted.

Pottery manufacturers in West Virginia and eastern Ohio are vitally interested in the outcome of the hearings held recently at Wheeling, W. Va., by examiners for the Interstate Commerce Commission, wherein it was shown that the rates on Florida clays to northern potteries are unreasonable. Many witnesses were examined. No time has been set when the commission will render its decision.

A banquet was recently held at Trenton, N. J., which brought together a large representation of pottery salesmen, some "Knights of the Grip" coming from as far as New Orleans and San Francisco. The salesmen met for the purpose of organizing into a permanent body, of which Lee Kelly was elected president and George Dyer, secretary and treasurer.

Pottery plants in the East Liverpool (Ohio) district are so busy that decorating shops have, at times, been compelled to work at night. The demand for decorated lines is greater than for plain white ware. The shortage of gas in the Eastern Ohio district has been a serious handicap to the manufacturers.

Domestic pottery manufacturers are enjoying the greatest prosperity in their history. Production is at a high point and the demand for American pottery is heavy. Less road work will be done by the traveling salesmen this year than ever before.

The Trenton (N. J.) Potteries Company has announced the promotion of two members of its executive staff, Elzy Aiken being the new general manager and Welling G. Titus sales manager. Both men have been in the employ of the company for about ten years.

Henry E. Buchanan, aged 75 years, and general superintendent of the Steubenville (Ohio) Pottery Company's plant, died recently. He was a member of the company since the firm started business.

There is a scarcity of skilled workmen in the pottery trade. It is stated that the shortage in kilnmen and clay shop workers is the greatest, labor officials being unable to supply the manufacturers with all the help required.

MACHINERY *and* EQUIPMENT

Descriptions of Machinery and Accessories and Detailed Announcements That Our Advertisers Believe will Interest Our Readers

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"Brick and Clay Record's" Advertisers and Their Displays at the N. B. M. A. Convention

(Continued from March 7)

The merits of Leviathan and Anaconda belting were told many times during convention week by E. F. Deckert and E. A. Booth, Main Belting Company representatives from Louisville and Buffalo respectively.

The interests of the Mathews Gravity Carrier Company, of Ellwood City, Pa., were well cared for by R. F. Kumler of the Cleveland office. The majority of the best clay plants in the country now regard the Mathews product as indispensable, and Mr. Kumler was quite busy listening to words of praise that came from all quarters.

Nuttall cut gears are used now on many clayworking machines as regular equipment, and have also replaced many cast gears on operating machines. The clay-products industry is a most important one now for R. D. Nuttall Company, of Pittsburgh, which was represented at the convention by Lester H. Keim.

R. D. McManigal of the McManigal Grateless Furnace Company, Logan, Ohio, had many opportunities to tell of the big saving in burning costs being accomplished by the superheating system.

W. W. Smith, inventor of the Samson Interlocking Tile, was down from Shallow Lake, Ont., Canada. His product is being adopted to a greater extent in the United States each year, and indications point to a most successful year during 1916.

C. H. Horton, the well known Second-Hand Machinery man of Painesville, Ohio, was busy among the delegates, many of whom he could greet as customers of several years standing.

Scores of brick manufacturers are familiar with the accomplishments of the Improved Hook Patent Up-and-Down Draft Kiln, as was evidenced by the reception accorded C. Hook and J. E. Wiltshire of the Ohio Kiln Company, Vigo, Ohio. They also made many new friends during the week.

Arthur O. Dupuy of the C. O. Bartlett and Snow Company, Cleveland, spent many busy hours telling of that company's latest accomplishments, particularly Mr. Dupuy's Soft-Mud Machine with special dumping device.

Representatives of the Dunn Wire-Cut-Lug Brick Company of Conneaut, Ohio, were much in evidence during the week, and they were especially proud of the large number of additions to their licensed operators, among them several of the largest paving brick plants in the country. Frank B. Dunn was accompanied by W. C. Perkins, R. T. Stull, W. T. Blackburn, F. T. Townsend and H. G. Lehrbach. Dunn pencils were acceptable gifts from each of these gentlemen.

Harshaw, Fuller & Goodwin Company of Cleveland were represented by R. D. Londrum of their Department of Service, who received old and new friends at their room. This

GANDY

One Word—GANDY
and What It Means

THIRTY-EIGHT years ago there was just one kind of stitched cotton duck belting made in this country.

That was GANDY.

Then, and in following years, Gandy proved to be such a success that other concerns imitated it. They made cotton duck belting, too.

But GANDY was—and is now—so dominant in the whole belting industry that the name "Gandy" came to be used to designate *any* make of cotton duck belting.

For this reason, belt users who realize that Gandy pre-eminence is due solely to its superior value should take extra precaution not only to write the word "Gandy" into each belting order, but to examine the belting sent them to see that it has the Gandy trademark stamped on it.

Write for sample and prices. There is no obligation.

The Gandy Belting Company
732 W. Pratt Street
Baltimore, Md.

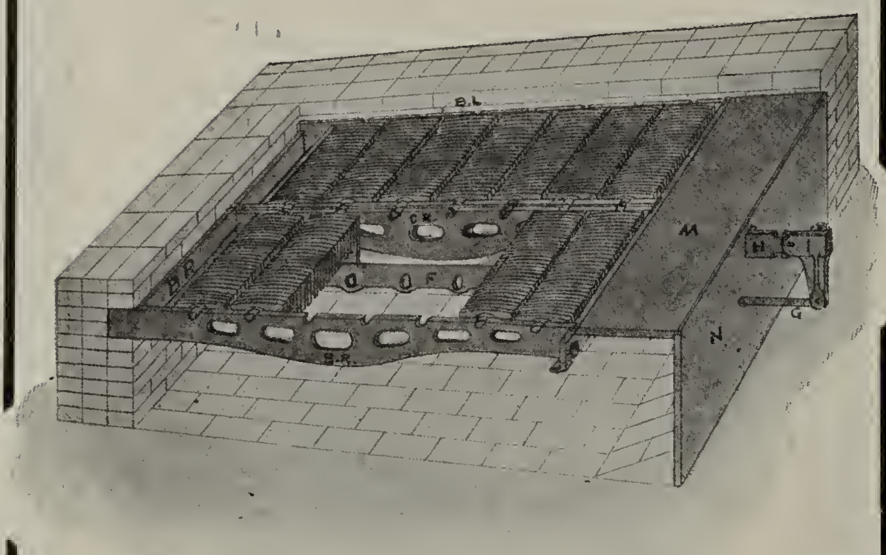
New York Branch
36 Warren Street

GANDY'S BELTING

Don't Read This Ad.
if——
You Don't Use Boilers

otherwise—read it—there
is good news about

Cyclone Boiler Grates



Here are our claims—

Even distribution of draft.
No fuel gets into ash pit.
Locks level.
Burns cheap fuel.
No fingers to burn off.
Impossible to warp.

That's the kind of grate that you want

and we will sell it to you
on 90 days trial.

Write now for our Complete Catalog.

Cyclone Grate Bar Co.
BUFFALO, N. Y.

company has been well known to brick men in all sections for a great many years.

Members of the Roessler & Hasslacher Chemical Co. of New York were on hand in force, renewing old friendships and making new ones. They were greatly interested, as usual, in the A. C. S. proceedings. Brick men have come to know them so well that they need no introduction. Otto W. Will and Werner Malsch, of New York, Walter Schaffer of Chicago, were there, accompanied by H. W. Smith, G. Barlow, E. A. Brockman and C. H. O'Hara.

The Arnold Creager Company, of New London, Ohio, thru its representatives, J. F. Aten, president, and Frank McClellan, had many opportunities during the week to tell brickmakers about their new soft-mud brick machine. This has recently been installed in a large number of plants in the Central West and East.

Other companies catering to the clay-products field were also represented during the week, among them being the Westinghouse Electric and Manufacturing Company of Pittsburgh, Imperial Belting Company of Chicago, Atlas Car and Mfg. Company of Cleveland, General Electric Company of Schenectady, New York, L. E. Rodgers Engineering Company of Zanesville, Ohio, Lechtenberg Bros. of Quincy, Illinois, and J. A. Paradine Company of Erie, Pa.

The "Straight-Line" Belt Adjuster

As a "straight-line," it is the shortest distance between two points. So the "Straight-Line" Belt Adjuster stands for the shortest possible time between a slack or broken belt and the same belt efficiently tensioned—delivering maximum power; the shortest distance between a non-productive and a productive machine.

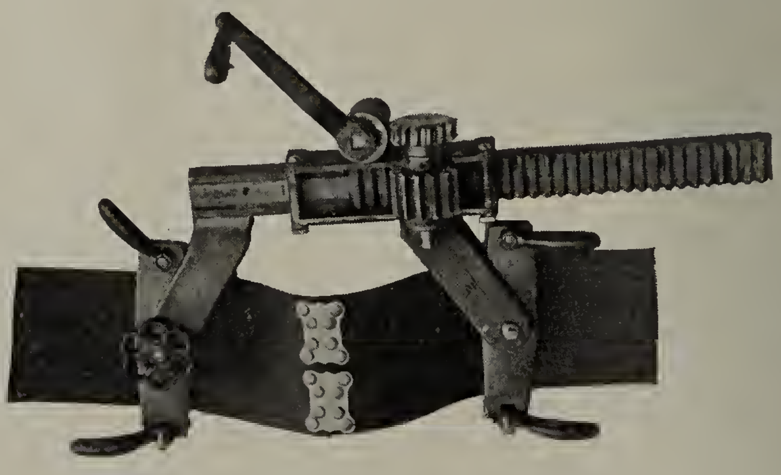
With one or more "Straight-Line" Belt Adjusters in use at your plant, the men can and will pull up any of their drives ready for fastening, in less time than it requires to even assemble the old style screw clamp.

No fussing with the "Straight-Line" Adjuster—its clamps are quick-acting. One side of each has a shackle fastening, enabling the operator to quickly put the clamps over a slack belt or insert the ends of a broken belt,—swing on shackle, tighten clamps and turn the crank until he has the desired tension. A recent test on an 8-inch belt showed 30 seconds from time of starting to install adjuster, to time belt was pulled up ready for fastening.

The worm gear drive is positive—no slippage and no passing by just the proper tension.

The "Straight-Line" Belt Adjuster can be quickly separated in two sections, making it easy to carry and apply to overhead or difficult drives.

It stands absolutely for "Safety-First," as it compels the men to install their belts right on the pulleys—no more guess



How the "Straight-Line" Belt Adjuster Works—"Safety First" work and "bulling" on belts, thereby endangering employes as well as life of belts and bearings.

The "Straight-Line" Belt Adjuster stands for the last word in efficiency in handling belts in service. More information can be obtained from the Cleveland Fabric Belting Company of 1480 West 110th St., Cleveland, Ohio.

Remove Your Boiler Scale

Boiler scale is a nuisance that 85 per cent of the clayworkers must contend with, for at least that many claywork-ing plants use steam power.

The Illinois Boiler Cleaning Compound has solved this problem for many users of steam power; and testimonials show that its ability to keep the boiler free from scale, or to remove it after its formation, is very remarkable. Local conditions or problems have not presented, in any case, obstacles that have hindered its success in removing scale.

It is prepared in either the liquid or powder form. The boiler is treated but once each month, being blown out occasionally between treatments, and one small package of this compound will keep a 50 h.p. unit free from scale.

If you are among those to whom boiler scale causes a large annual loss in fuel and boiler efficiency, besides endangering the lives of the workmen by subjecting them to the danger of an explosion, caused by over-heated tubes incrustated with scale, then write the Illinois Boiler Cleaning Compound Company, 127 North Dearborn St., Chicago, Ill., and let them solve your problems.

The Screen for Clay and Shale

Catalogs and volumes could be written relating the merits and structural points of Newaygo screens, but in the minds of possible buyers nothing could be as convincing as the stories of actual satisfactory service being given by the screen in dozens of clay plants.

It is this fact—satisfactory use in screening, over a term of years—coupled with the willingness of the buyer-user to openly state his good will and feeling, that gives the Sturtevant Mill Company confidence that the Newaygo is of exceptional value for clay plants.

As noted above, the screen is used on many plants—here is a partial list: The East Ohio Sewer Pipe Company, Illinois Clay Products Company, General Refractories Company, The Kier Fire Brick Company, The Olive Hill Fire Brick Company, The Belt Line Brick Company, The American Enameled Brick and Tile Company, The Didier-March Company, Philadelphia & Boston Face Brick Company, and a great many others.

The Pittsburg Tile Manufacturing Company, in a letter to the Sturtevant Company say: "If you are in need at any time of a good, healthy reference as to the sterling qualities of the Newaygo Separator, just refer them to us."

Complete information can be secured from The Sturtevant Mill Company, of Boston, Mass.

Thomas B. Crawford was called by death on February 18, at the Methodist hospital in Indianapolis, Ind.

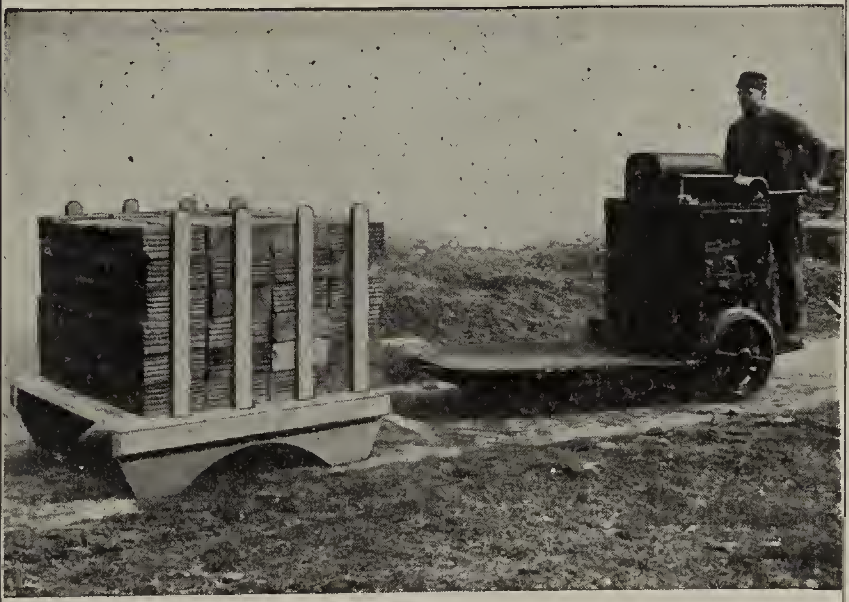
The deceased was 29 years of age, the youngest of four sons of C. W. Crawford, president of the Crawford & McCrimmon Company, Brazil, Ind., builders of mine and clay plant equipment machinery. All sons were actively engaged in the business.

He was responsible for a great many improved methods in modern foundry practice and assisted largely in designing and laying out the modern new plant of the Crawford & McCrimmon Company.

Elwell-Parker
"Self-Loading"
Electric Trucks

will reduce your cost of transfer between press, drier, kiln, yard and cars as they have elsewhere.

Place products on separate platforms, racks or cars, and truck will AUTOMATICALLY pick up load and carry it anywhere about the plant. No skilled labor required to operate.



Delay is Dangerous

Install this **modern transfer method,** enabling you to handle clay products in units of 500 to 800 pieces, or 4,000 lbs., at four times walking speed. Reduces not only cost of trucking, but also spoilage.

Let us co-operate with you in working out a system for handling brick, tile, pipe, pottery, or odd shaped fire clay, such as furnaces and glass pots.

Write for Bulletin No. 114.

Elwell-Parker Electric Co.
Main Office and Works, Cleveland, O.
New York Office, 50 Church Street

The economy
and efficiency of
Drilling
BIG BLAST
HOLES
Has Been
PROVED
TO - - YOU

Without a doubt in the world—you are convinced—sold on the proposition that the manner in which you can save—keep from spending each year—from one to five thousand dollars is for you to use the

Cyclone Drill

You will recall that on some plants the original cost of the drill is being saved every three months.

It is being done by the ability of the drill to get out the material in greater volume, in better shape for handling, at half the explosive cost, with less men.

Send for Bulletin B4

THE
Sanderson-Cyclone
Drill Co.
ORRVILLE, OHIO

THE SANDERSON CYCLONE DRILL

Stevenson's New Catalog

It is just recently completed and ready for mailing—at your request for it.

In addition to the standard line of dry and wet pans, sewer-pipe presses and stiff-mud machinery, the catalog contains a list of necessary appliances that are brand new.

For instance, there is illustrated a power-driven ring cutter that is valuable to sewer-pipe and drain-tile manufacturers.

Another device not widely known is a kiln crane—it is used in the setting kiln to set large sewer pipe, and can easily be adapted to setting all classes of heavy, cumbersome pieces.

The catalog deserves a place in your files. A request to The Stevenson Company, at Wellsville, Ohio, brings it.

Boiler Grates

Every burned-clay manufacturer is a specialist in one of the various phases of clay products. As such a specialist he is prone to devote the major portion of his energy, his brain power, to the operations that have specifically to do with the forming, drying, burning and sale of his product.

The power transmission equipment, the engine, the boilers, and in general the power plant as a whole is sadly neglected. It is usually "left up to the engineer," who may or may not care a rap whether it's right or wrong—as long as the wheels turn and the envelope arrives as per schedule.

Even a little bit of thot, if applied intensively, will quickly show that the ordinary boiler room offers a fertile field for cost cutting, and in the type of boiler grates used is the first place to "stop, look and listen."

Coal is priced and paid for by the bushel or ton, and in the majority of cases it is a safe statement to make, that you are burning far too much of it. In other words, you can by using modern grates actually cut down your steam

SAMUEL STEVENSON
Founder of The Stevenson Company
Builder of the first Dry Pans in America

ORIGINAL PLANT—1869-1905

PRESENT PLANT

Catalog No. 47

Front Page from Stevenson's Catalog.

coal bill from one-third to one-half, and still produce sufficient power.

Martin Grates are doing this on hundreds of plants by cutting down the tonnage necessary and burning a cheaper grade of fuel. Get out your pencil and figure on your boiler room losses with the above as a basis, then write The Martin Grate Company at 347 S. Dearborn street, Chicago, Ill., and ask for figures.

A Jumbo Belt

The Hetterick Bros. Company of Toledo, Ohio, have just started to manufacture their largest single order of belting. It is a Conveyor belt approximately 2,000 feet long, 30 inches wide and eight ply—all for one job.

This firm has found that the predictions made last year—that all factories would want material and supplies at the same time—is now proving out.

Orders are coming in splendid fashion, and, as in other businesses, it will simply be a question of deliveries before the season is over.

It is becoming increasingly difficult to secure raw material, be it steel or fabrics and wise is the man who orders supplies now.

The Armleder Truck

Accompanying this is a cut of one of a series of new catalogs just published by the O. Armleder Company, of Cincinnati, Ohio.

The pamphlets are descriptive of both chain and worm-drive trucks, and show in a thoroly honest, clear fashion the merit points.

Armleder trucks have been found to give exceptionally good service in Northern Ohio, where they were used to deliver paving brick to country roads that were being bricked.

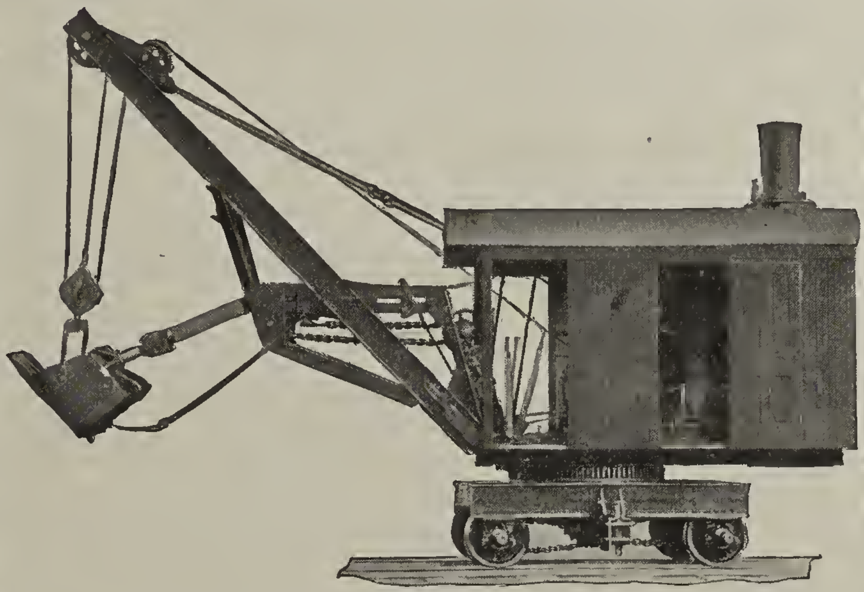
Bad roads to the job was the rule, but constant deliveries was a necessity, and the Armleder solved the problem.

Reducing Clay Haulage Costs

One of the big problems that has confronted manufacturers of clay products for many years is that dealing with the high cost of getting the clay from the pit to the machine room.

One of the Armleder Catalogs

A Thew Shovel will last 24 years



The first Thew Shovel did not look as good as this. It was not as good as this shovel. It will not last as long as the new Thews, yet the first Thew Shovel has been in continuous service 24 years.

This is what the owner says about it: "No better shovel was ever put up. It is not very handsome to look at, but is very economical in operation and does its work without any trouble. We can't say anything too good about the shovel."

The real test of any machine is the test of years. Hourly, daily or even monthly outputs are of secondary interest. The important question is what will the machine do year after year? The above statement shows that The Thew is equal to the supreme test.

The definite policy of building the best possible shovel regardless of cost of production and an honest endeavor to render the best possible service to every Thew owner makes it possible for the Thew Automatic Shovel Company to refer to any Thew owner anywhere.

Use a Thew—It pays—Join the Thew Boosters Club. There are over 300 Brick manufacturers who are loyal Thew Boosters. Write for the names of those near you.

Circular 22-C gives actual costs of handling clay.

The Thew Automatic Shovel Co.
Lorain, Ohio

With the coming of the time to make a new coal contract

and the uncertainty of the outcome of the Miner's Wage Controversy now on

it behooves the manufacturer of brick and clay products to have a complete and accurate knowledge of conditions in the coal trade from week to week. Not that he merely knows of those things having a direct bearing upon his business, but that he may prepare himself against any shortage of coal by placing his contract and orders in accordance with conditions.

THE BLACK DIAMOND

for over 30 years the coal trade's leading journal, publishes the greatest amount of news and information pertaining to the situation.

The Annual Steam Coal Contract Number, the March 18th issue contains much in its editorial and advertorial pages that will help you to more economical use and buying of coal for your particular purposes.

May we help you to a more accurate knowledge of conditions in the coal trade, by beginning your subscription with that Number? Costs but $3.00 the year. Issued weekly.

THE BLACK DIAMOND
Manhattan Bldg., Chicago
New York Cincinnati Pittsburgh

This involves not only the cost of transportation, but also the necessity of keeping the clay supply of sufficient volume to run the machines to capacity without loss of time.

During the past three years, many of the largest clay plants in the country have solved this problem in a most satisfactory way by installing the Plymouth Locomotive. One of these is the Ohio Clay Company, of Cleveland, a photograph of whose clay bank is shown on this page, with the Plymouth Locomotive in the foreground. This is the parent company for the manufacture of the justly famous Denison Interlocking Tile. The installation of this locomotive is in keeping with this company's determination to equip its plant with the most efficient and economical methods of proved worth.

Ohio Clay Company's Bank and Pit, Showing Plymouth Locomotive—Also Thew Automatic Shovel and Cyclone Drill

The Plymouth Locomotive adds profits to any clay plant. This is based on actual tests under practical conditions for the past three years by clay products manufacturers, who have bought and used these "Little Giants of Power." The manufacturer who keeps accurate cost data is the one who is naturally the most enthusiastic.

The experience of The J. D. Fate Company, of Plymouth, Ohio, peculiarly fits them for the successful manufacture of the Plymouth Locomotive, since besides their knowledge of the clay products industry, they were formerly builders of gasoline motor trucks. In fact, it was their intimate acquaintance with the needs of the industry that prompted them to discard motor truck building for the manufacture of the Plymouth Locomotive.

This company has a mighty interesting booklet that every clay product plant should have: "Cutting Haulage Costs in Clay Plants." Just ask for it—they will gladly send you a copy.

A new catalog has just been issued by the Homestead Valve Manufacturing Company of Homestead, Pa.

It is replete with information about all types of valves for every use, and also shows very clearly in photographs the construction and sectional views.

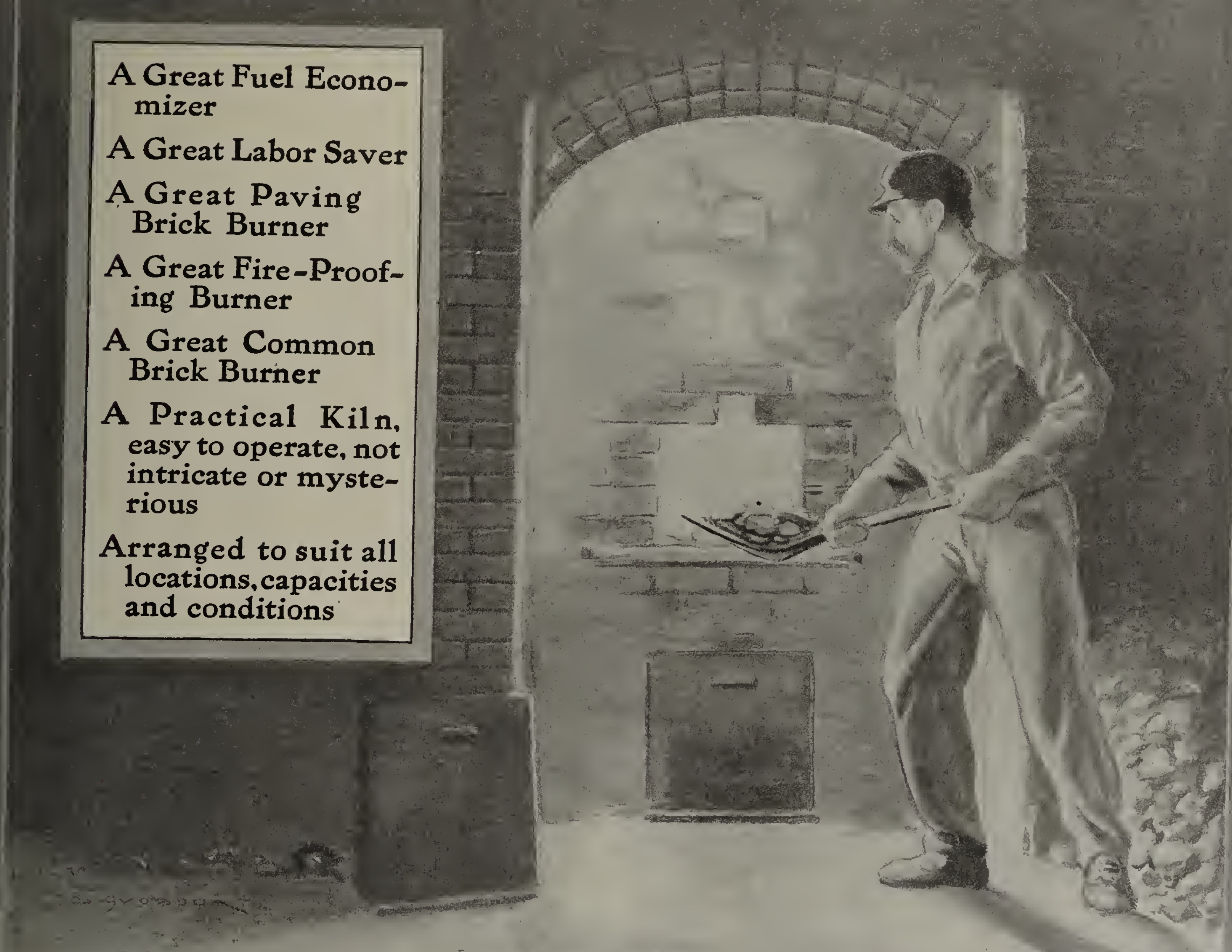
Every clay plant engineer and master mechanic should have one.

A monthly booklet, published by the Federal Motor Truck Company of Detroit, Mich., is devoted to news about trucks and reliable cost data from actual operation.

For the clay-products manufacturer or dealer, this Federal Traffic News should make a very valuable monthly visitor, and will be sent free on request.

HAIGH'S NEW SYSTEM
CONTINUOUS KILN
--- Owned and Controlled by ---
The American Clay Machinery Co.

- A Great Fuel Economizer
- A Great Labor Saver
- A Great Paving Brick Burner
- A Great Fire-Proofing Burner
- A Great Common Brick Burner
- A Practical Kiln, easy to operate, not intricate or mysterious
- Arranged to suit all locations, capacities and conditions



THE HAIGH KILN CAN BE FIRED WITH COAL AND
- OIL, WOOD, NATURAL GAS OR PRODUCER GAS -
FOR ESTIMATES AND TERMS ADDRESS
THE AMERICAN CLAY MACHINERY CO.
BUCYRUS, - - OHIO

The
BUYERS' DIRECTORY
Of Clay Products Machinery Manufacturers

Analysts and Chemists, Clay.
Ceramic Supply & Cons. Co.

Aerial Tramways.
Broderick & Bascom Rope Co.
Ambursen Co.

Asbestos Roofings.
Johns-Manville Co., H. W.

Automobile Trucks.
Armleder Co., The O.
Federal Motor Truck Co.
Kissel Motor Car Co.

Babbitt Metal.
Cleveland Alloys Co.
Gerlock, H. W.

Barrows and Trucks.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Chicago Brick Machy. Co.
Fate Co., The J. D.
Manufacturers Equipment Co.
Toronto Fdry. & Machine Co.

Barytes, Carbonate of.
Gabriel & Schall.
Roessler Hasslacher Chem. Co.

Belts.
American Clay Machinery Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Gandy Belting Co.
Hettrick Bros. Co.
Main Belting Co.
Manufacturers Equipment Co.
Quaker City Rubber Co.
Sawyer Belting Co.
Scandinavia Belting Co.

Belt Adjuster.
Cleveland Fabric Belting Co.

Belt Conveyors.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Gandy Belting Co.
Hettrick Bros. Co.
Link-Belt Co.
Main Belting Co.
Manufacturers Equipment Co.
Morse Chain Co.
Scandinavia Belting Co.
Weller Mfg. Co.

Belt Dressing.
Hettrick Bros. Co.

Belt Fasteners.
Crescent Belt Fastener Co.
Flexible Steel Lacing Co.

Blasting Machines.
Ceramic Supply & Cons. Co.

Blocks.
Broderick & Bascom Rope Co.

Blowers.
American Blower Co.
Manufacturers Equipment Co.
Trautwein Dryer & Eng. Co.

Boilers.
(See Engines and Boilers.)

Brick Conveyors.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Link-Belt Co.
Manufacturers Equipment Co.

Brick-Handling Machinery.
Mathews Gravity Carrier Co.

Brick Machines (Dry Press).
American Clay Machinery Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Chicago Brick Machy. Co.
Illinois Supply & Cons. Co.

Brick Machines (Soft Mud).
American Clay Machinery Co.
Bonnot Co.
Eastern Machy. Co.
Manufacturers Equipment Co.

Brick Machines (Stiff Mud).
American Clay Machinery Co.
Bonnot Co.
Chambers Bros. Co.
Fate Co., The J. D.

Cables and Cableways.
Broderick & Bascom Rope Co.

Cars, Trucks and Turntables.
American Clay Machinery Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Chase Fdry. & Mfg. Co.
Fate Co., The J. D.
Gerlock, H. W.
Manufacturers Equipment Co.
Orenstein-Arthur Koppel Co.
Standard Dry Kiln Co.
Pettigrew Foundry Co.
Toronto Fdry. & Machine Co.
Weller Mfg. Co.
Youngstown Steel Car Co.

Cartons.
Hinde & Dauch Paper Co.

Cement.
Lehigh Portland Cement Co.

Chains (Steam Shovel).
Woodhouse Chain Works.

Clay Feeders and Mixers.
American Clay Machinery Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Fate Co., The J. D.
Louisville Machine Co.
Manufacturers Equipment Co.
Marion Mach. Fdy. & Sup. Co.
Schaffer Eng. & Eq. Co.

Clay Handling Machinery.
Clearfield Machine Shops.
Link-Belt Co.
Weller Mfg. Co.

Clay Plants Complete.
Chambers Bros. Co.
Gerlock, H. W.
Manufacturers Equipment Co.
Trautwein Dryer & Eng. Co.
Weller Mfg. Co.

Clutches (Friction).
Chambers Bros. Co.
Hill Clutch Co.
Link-Belt Co.
Schultz & Son, A. L.
Weller Mfg. Co.

Coal.
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Manufacturers Equipment Co.
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(See Cars.)

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Engelhard, Chas.
Taylor Instrument Companies.

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Englehard, Chas.

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Manufacturers Equipment Co.
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(See Barrows and Trucks.)

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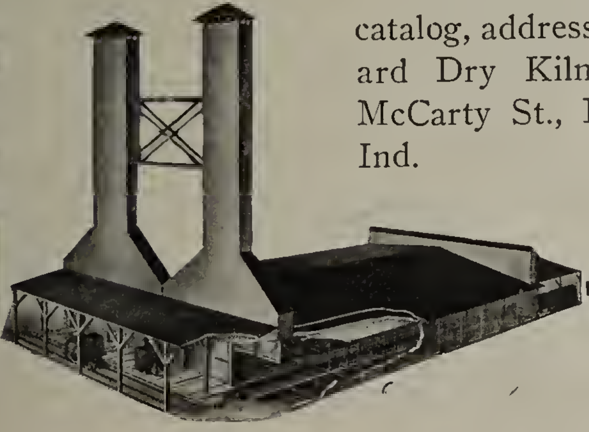

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is regrinding and renewable. All parts replaced with ease. It is unconditionally guaranteed for this work.
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Strictly hand welded by expert workmen and made from a special rerolled double refined iron.
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Clean, Economical, and Satisfaction Guaranteed.
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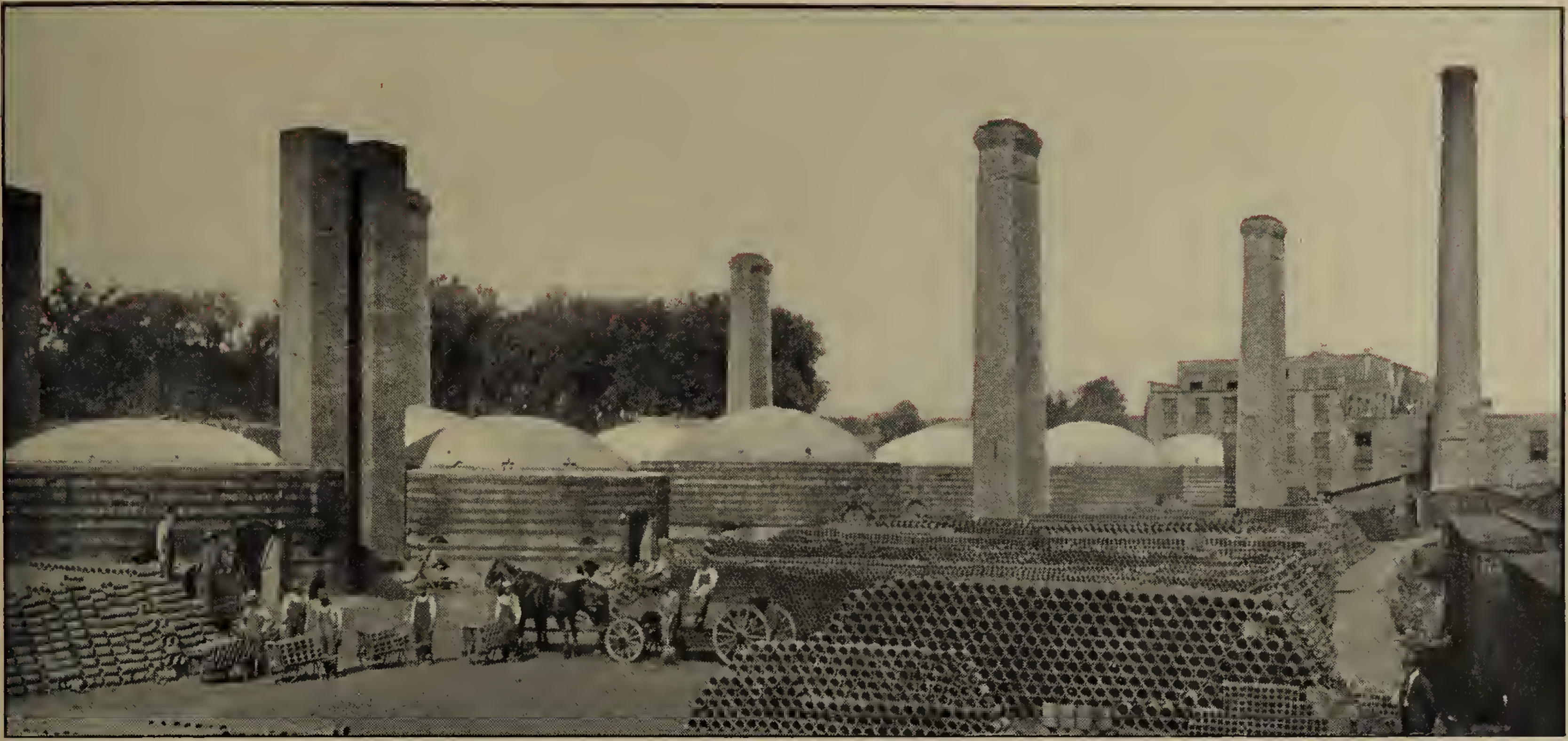

For a lasting, gas-tight, air-tight Kiln, use J-M Heat Treatment

The importance of sound Kiln masonry is well known to every brick and pottery manufacturer.

The maintenance of constant draft, temperature and even kiln efficiency requires constant watchfulness against masonry imperfections.

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is the one positive way to insure lasting Kiln masonry. It comprises the use of two cements, No. 31 and No. 32.

No. 31 J-M High Temperature Cement when placed between fire brick and heated, vitrifies at a very low kiln temperature. It does not shrink or expand up to 3,200 degrees F. and increases constantly in mechanical strength up to that point. It effectively checks all tendency toward unequal contraction or expansion of the setting, thus preventing fissures, checks, bulging and settling.

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Over this entire range of temperature it never loses its property of flexibility and elasticity. If the bricks expand or contract—so does **No. 32 cement.**

FOR POTTERY SAGGERS

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"OLD BEN"

FRANKLIN COUNTY—SPIRAL CLEANED

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Produces Fine Color—Burns with Long, Hot Flame—Uniform in Quality—Low in Ash and Sulphur—Stocks Well
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BRICK and CLAY RECORD

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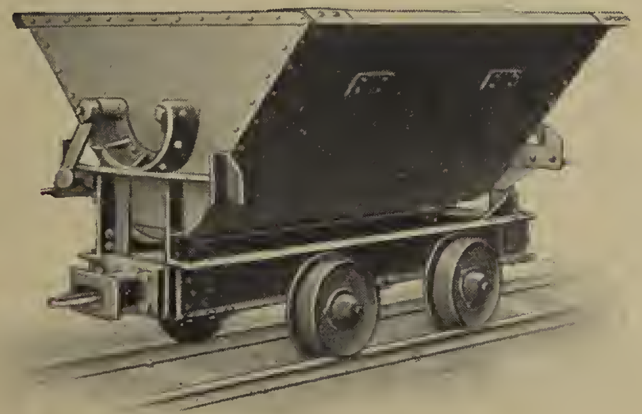
It is designed with one big idea in mind: that it should haul clay not for a year—but for years.

Dumping, derailment, dipper hammering—the roughest kind of treatment—are all resisted successfully by this tough made car.



Don't think of cars unless you think
"Youngstown"

THE YOUNGSTOWN
STEEL CAR COMPANY
YOUNGSTOWN, O.

Vol. XLVIII, No. 7 Chicago April 4, 1916

WELLER-MADE

WHICH?

Old Style Methods

20 to 25c per ton

To get coal to boiler house and to kilns required two horses, two carts and an average of four men.

For Retail Trade it took wagons or auto trucks from 70 to 90 minutes from time they drove into yard until they weighed out.

Demurrage frequently amounted to from $15.00 to $30.00 per month.

Loss from coal falling between cars and wagons was a serious item.

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In Gondola cars—5c to 10c premium.

New Style Methods

3 to 5c per ton

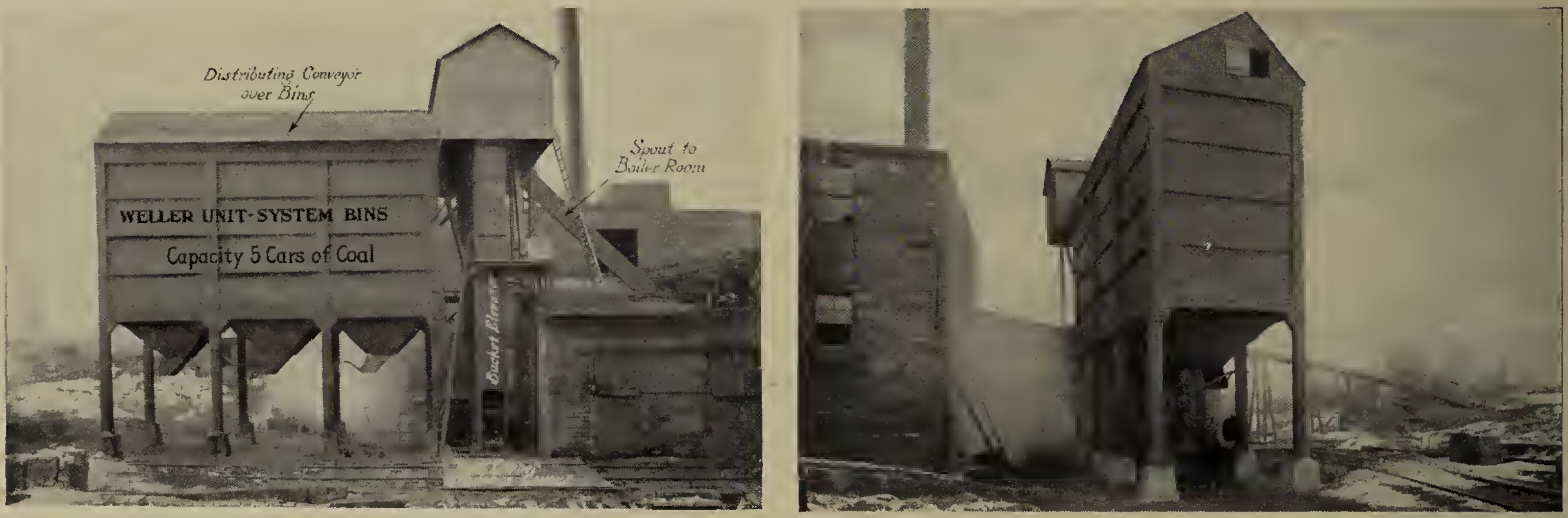
One man, with one horse and cart, supplies all kilns **before noon.** Coal for boiler room is spouted direct, no labor.

Average time regardless of size of load—**10 minutes. Saving one hour.**

Demurrage
Loss } "Ain't none"
Theft

Hopper-bottom cars—saving 5c to 10c.

It is up to you to say what your coal handling will cost



Coal Handling Plant L. W. Camp Co., Akron, Ohio

Each plant has certain peculiarities so that it is impossible to lay down any set rule. Certain general principles are always involved which simply require a combination of certain of our standard equipment properly assembled to meet the conditions.

There is a shortage of satisfactory labor in many localities and if something is not done to offset this condition, many clayworking plants will be up against a serious problem during the coming season and it is better to get ready now.

If it is handling coal, clay, shale or other material around your plant we can and will help if given a chance.

We know how to, and do, build good

Elevating, Conveying and Power Transmitting Machinery

WELLER MFG. CO. **CHICAGO**

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the Post Office, at Chicago, Ill., Under
the Act of March 3, 1879.

Terms of Subscription
One Year—(24 Numbers)
United States......$2.00 Foreign $3.00
Single Copies.......25c

Published the first and third
Tuesdays of each month by

Kenfield-Leach Company
445 Plymouth Court Chicago

Chicago, April 4, 1916

Vol. XLVIII No. 7

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Standards of Practice for Business Publications

The publisher of a business paper should dedicate his best efforts to the cause of Business and Social Service, and to this end should pledge himself: 1. To consider, first, the interests of the subscriber. 2. To subscribe to and work for truth and honesty in all departments. 3. To eliminate, in so far as possible, his personal opinions from his news columns, but to be a leader of thought in his editorial columns, and to make his criticisms constructive. 4. To refuse to publish "puffs," free reading notices or paid "write-ups;" to keep his reading columns independent of advertising considerations, and to measure all news by this standard: "Is it real news?" 5. To decline any advertisement which has a tendency to mislead or which does not conform to business integrity. 6. To solicit subscriptions and advertising solely upon the merits of the publication. 7. To supply advertisers with full information regarding character and extent of circulation, including detailed circulation statements subject to proper and authentic verification. 8. To co-operate with all organizations and individuals engaged in creative advertising work. 9. To avoid unfair competition. 10. To determine what is the highest and largest function of the field which he serves, and then to strive in every legitimate way to promote that function.

The EDITOR'S CORNER

Comment, Criticism and Advice on Live Issues Affecting the Manufacture, Marketing and Manifold Uses of Burned Clay Products

AN EXHIBIT which attracted considerable attention at the recent Complete Building Show was that in the National Lumbermen's Association booth. It showed a model mill-constructed factory building, the exterior walls of which were brick, with a heavy timber interior.

One reason, perhaps, that this exhibit contained more than ordinary interest, was because it showed a brick building in a space that had been reserved and paid for by lumbermen. But to the visitor that looked beyond the surface and made a closer study of the model factory building, he saw more than the curiosity-arousing fact that one industry was seemingly "boosting" a competitive material. He saw a type of factory building that has many excellent qualities and advantages—very good reasons for its being advocated by the lumbermen, altho it is far from being entirely built with their material.

A feature of the tremendous amount of building that is now going on in this country, is the large number of factory buildings being erected. Just how many of these factories are being built with brick is questionable. It is certain that not all of them are, possibly not even a majority.

Now is a good time for the brickmaker to turn his attention to factory construction and seriously consider the inauguration of a campaign to disseminate facts and information concerning the mill-constructed type of building, particularly among prospective factory owners.

This type of building, when equipped with automatic sprinklers, is one of the safest fire risks known to underwriters. The experience of the Factory Owner's Mutual Insurance Company in New England proves this. This company is a mutual underwriter of cotton mills, which at one time were refused insurance from the old line companies, and were compelled to organize for protection. Because of the prevalence of the mill-constructed factory with exterior walls of brick thruout New England, with its consequent low fire hazard, this mutual insurance company is paying back to its supporters, dividends that are as high in some years as ninety per cent of the premiums collected.

Then again, the jar of machinery in the mill-constructed factory building is quickly and easily absorbed by the heavy timber interior and the brick walls, while monolithic concrete buildings transmit these vibrations to the workers who stand about the machines. Medical science has attributed the numerous cases of nervous breakdowns among factory employes who work in monolithic buildings, to this condition.

These, and a host of other facts, are available to the brickmaker who will make use of them in an effort to widen his market and create a greater demand for his product in a field that has untold possibilities, especially now, when the number of new business enterprises is daily increasing by leaps and bounds and when the demand for well-built, low-cost factory buildings is almost unparalleled in the commercial history of this nation.

Dawn is Breaking

COMPETENT authorities are predicting an early termination of the war in Europe. Coincident with these prophecies, are various signs that point to a new and altogether different industrial condition in this country, which will follow close upon the heels of a general peace.

Without regard to their individual prejudices, these writers are a unit in their praise of German efficiency. They call this—or will call it—the great lesson of the war.

Fostered by a governmental helpfulness—or control, if you will—the German people have attained an almost ideal co-operation in almost every line of industrial endeavor. Wastefulness has been checked. By-products have been developed, utilized, forced to a point where, thru them, German manufacturers have controlled world-markets. Prices have been stabilized. Ruinous competition has been brought to a vanishing point.

Groping in the dark—or it may be only in the shadow—caused by an anti-monopoly law that has been ineffective in every direction except that of stifling progress, the business interests of the United States have been organizing and, thru little associations, have done much to bring about an industrial strength that would otherwise have been impossible.

The great lesson of the war is that national strength may be developed by industrial co-operation.

It is within the bounds of reasonable thought to believe that this lesson will be brought home to legislatures—state and national—to the end that the Sherman Act and similar enactments may be replaced by a sensible governmental regulation which will extend to manufacturers in every line the same incentive to co-operative work that is now given the railroads by the Interstate Commerce Commission, and to the public the protection of what might well be called "a poor man's court."

Two Extremes

THE eternal question on practically every clayworking plant is "How much can we get for our product?"

Sometimes this question is varied and becomes "How much *should* we get for our product?"

These questions describe the uttermost limits of weakness and strength.

"How much *can* we get for our product?" indicates that the selling price is to be based upon the old and time-worn proposition of loading a rate that is as high as "the market will bear."

It ignores every question of cost and frankly states that sales will be made at cost, if necessary, and that any margin above cost will be considered gain.

It is putting a premium upon the kind of salesman that is fast disappearing—the man who considered his ability to plausibly deceive the prospect, as his best asset. For, if the object is to "get as much as possible" for a commodity, one buyer would be made to pay more than another for the same material.

And much too often this higher price and greater margin is obtained thru some "misstatement" on the part of the man who has made the sale.

The plant owner, or sales manager, or dealer, who starts out with "How much should I get for this material?" looks at the matter from an entirely different angle.

In the first place, from the very fact that he asks "How much should I get?" he is compelled to ask himself "How much is this brick—or tile or any other clay product—worth?" It leads him to study the cost of the material which he is handling and to add to that cost, the cost of handling it.

In other words, he perfects his own knowledge of the material which he is about to sell and decides that he must receive a certain price for it or no sale will be made. He knows in advance that that price will give him a certain profit.

A man who starts out with the "How much can I get?" idea intends to entrap the unwary, if he can, making capital out of the ignorance of others and then, perhaps, squandering all he makes when he meets up with the buyer who knows as much or more about the material that is being offered him as does the man who is selling it.

Get the Right Basis

THE moment a man decides that he wants to know how much his material is costing him, he has taken a tremendous step across the distance which separates success from disaster.

The trouble about the clayworking business is that few plant owners *really want* to know. Year in and year out the plant is run—sometimes eight months, sometimes twelve—more years showing a profit than a loss.

Checking up on the gross figures, these plant owners find (and are well satisfied to find) that the years when losses were sustained were years when the plant was closed down an unusually long time or where, as the phrase is, they "fell down" on production.

The obvious remedy for this condition, it would seem, is to run the plant to capacity, every year, whether business was good or not. The only trouble about this is that the sheds would be overstocked, the aisles choked, the running capital all tied up in material that did not show any great desire to flow out into the markets and—several other points of similar importance.

Did it ever occur to you that, since you are inevitably compelled to take a loss in dull seasons, thru the necessity of running part time, that your plant proposition did not balance up with your market?

Or—to make that plainer—if the market, even in a dull season, will not take all of the material that your plant can produce, running full time, then you are maintaining an extra capacity, for which the market should pay in more prosperous years.

The trouble is, costs are figured, as a rule, on maximum production; or, rather on the production of good years.

The average man likes to remember the time when he made his material for a certain low price and, likewise, likes to forget the time when the same material, per ton or thousand, cost him a great deal more.

And then, when he gets ready to set his selling price—always allowing that he is basing it upon his cost—he seldom, if ever, takes a high cost year as his basis.

Two Commercial Diseases

NOT ONLY must we cultivate commerical health, but we must eradicate commercial disease. Such was the opinion expressed by R. Goodwyn Rhett, newly elected president of the Chamber of Commerce of the United States, to various commercial organizations before which he spoke recently.

There is little doubt but that commercial disease is just as real as physical disease and its prevalence has just as harmful an effect upon industrial growth as the prevalence of physical disease has upon the growth of population in this, or any other nation.

One of these commercial diseases is "pessimism"—which too often masquerades under the synonym of "conservatism." Pessimism is a commercial cancer that eats out the heart of enterprise. True conservatism is a balance wheel which is very essential to successful business, but pessimism that sees only failure, calamity and disaster for everything existing or proposed, is as much to be dreaded as a noxious physical disease would be dreaded by a municipal health department.

While it is hard to imagine how anyone could be pessimistic with the smoke from America's factories clouding the sun and the lights from their windows turning night into day, still amid the opportunities for commercial advancement which are coming thick and fast, it is easy to see how the pessimist might become, literally speaking, "a monkey wrench in the machinery." Chronic pessimism is a dreadful affliction, and the man who acquires it is much to be pitied.

Another commercial disease is commonly known as "knocking." It is quite different from pessimism, yet almost equally harmful. It is commercial gossip—repeating disparaging rumors about business men and enterprises with an added touch of exaggeration, attributing low or mean motives and finding fault generally, merely because of the pleasure of fault-finding.

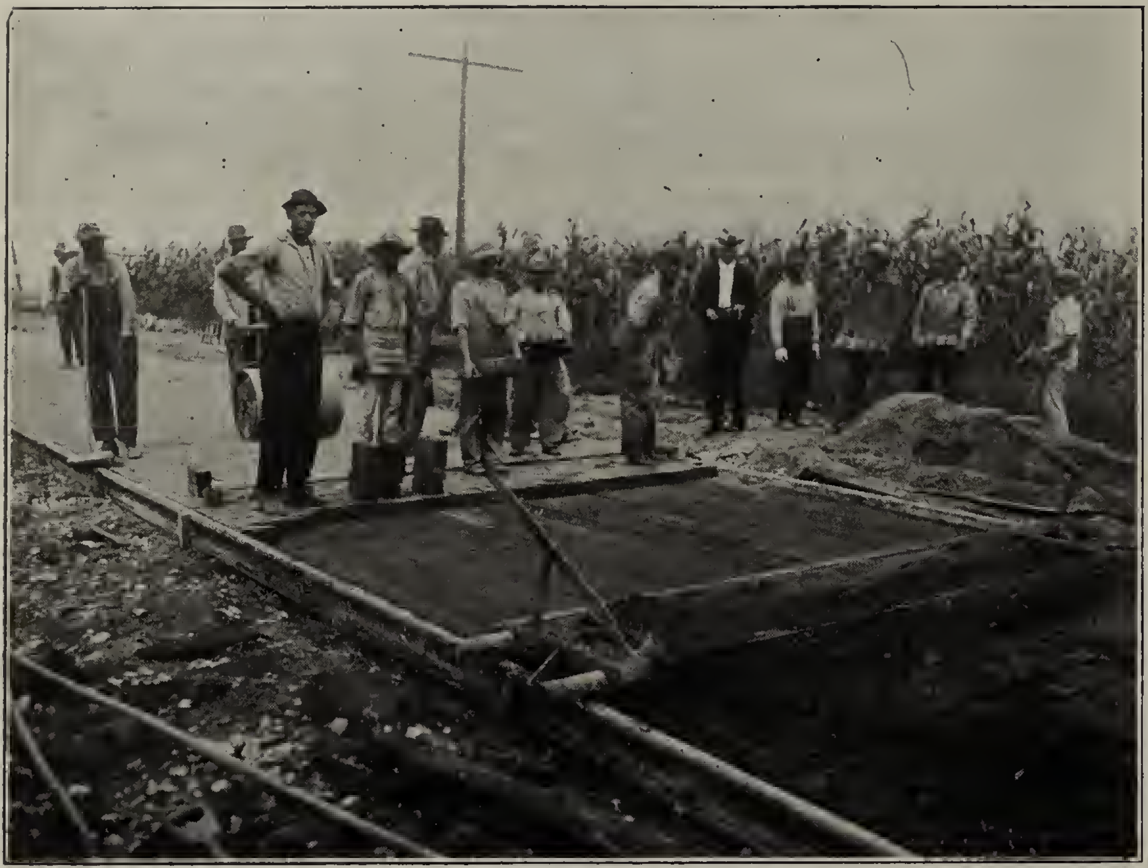
About this time every year, especially in the large cities, public welfare organizations and the press sound the rallying call for the annual summer "swat the fly" campaign. There is no need of dwelling upon this or similar civic movements for reducing mortality and making this world a safer and better place in which to live. They are familiar to nearly every citizen.

There is dire need for a "swat the knocker" campaign—not just seasonal, but perpetual. Such a movement would do much toward improving commercial health and save many business lives which are now succumbing to "disease germs" spread by the deadly "knocker."

The man who belittles his competitor or says mean things about him, does more to reveal his own character than he does harm to his neighbor. "Knocking" is the product of disappointment and inability, whether it be in the management of a plant or the sale of its product.

BUILDING BRICK ROADS

The so-called "monolithic" type of brick road, after several years' oblivion, has been dug up, and with some important changes over the former method of construction, is finding great favor with highway engineers, particularly in the building of rural roads.



The Double Steel Template That Was Used on the Edgar County, Ill., Roads to Bring the Concrete Sub-base to a True Level

WHILE the saying that "Good Roads Mean Big Loads" may be somewhat shopworn, its truth, so far at least as the farmer is concerned, was never more apparent than now. According to figures secured by the United States government on muddy earth roads such as were experienced in many states during the past summer, the maximum load for hauling is 800 pounds. Passing over the figures for other types of highways under similar conditions, and touching the high spot in the ability of roads to facilitate traffic, we find that the same authority gives the average load hauled over a brick road as approximating 8,000 pounds—ten times larger than the load which most farmers care to haul over a dirt road.

For many years rural roads paved with brick have been built thruout this vast continent, giving comfort and satisfaction. The method of constructing these roads is familiar to nearly every manufacturer of paving-brick, and nothing further need be said on this subject at this time. However, there is a type of vitrified brick road, concerning which comparatively little is as yet known. It is the so-called "monolithic" brick pavement—monolithic meaning literally "one stone," that is, the pavement is one solid piece of masonry. Unlike the usual method followed in building a brick road, the sand cushion is eliminated and the brick set on the concrete foundation while it is "green."

MONOLITHIC ROADS REVIVED AT PARIS, ILL.

Some very excellent types of this road may be seen in Edgar county, near Paris, Illinois. These roads were constructed during the summer of 1915 and included highways upon which there is a large amount of traffic, much of which is from the farm to the city. One of the roads that was the last in this particular group to be paved, was originally designed as a part of the Dixie Highway and is the main telegraph road thru this part of the country. These highways, illustrations and a description of which are given herein, were built under state aid and were approved by the Illinois State Highway Commission.

In building the Edgar county roads, the sand cushion was eliminated and a very good pavement secured. In constructing these "rigid" or "monolithic" brick pavements, the brick were laid upon a "green" concrete base or foundation and were almost immediately rolled and grouted. Steel forms, as shown in the accompanying illustrations, the upper edges of which were set at a true level with the wearing surface of the pavement, were rigidly fixed in place to form temporary shoulders for constructional purposes.

SUB-BASE LEVELED BY DOUBLE TEMPLATE

A self-propelling mixer prepared the concrete for the sub-base and dumped it upon the road bed from buckets operated by a traveling crane. The concrete can brought to an approximately true cross-section by means of a tamping template, or it may be shaped by a template drawn over it as in the manner of smoothing a sand cushion. In the case of the Edgar county roads, a steel double template was used, the two blades of which were about two feet apart. This template was provided with four rollers at each end, which run on the side forms, as shown in one of the accompanying illustrations. The template had a six-inch I-beam in front and a six-inch channel in the rear.

The lower edge of the forward blade of the template was about $\frac{3}{16}$ of an inch lower than the lower edge of the rear blade, or $\frac{3}{16}$ of an inch more than the depth of the brick to be used. This blade cut the concrete base to the required surface lines. Between the forward and rear templates was kept a dry mixture of cement and sand, the proportions being either 1 to 4 or 1 to 5, as the engineer in charge prefers. This cement-sand mixture was spread in a film over the concrete base by the rear blade of the template, so that the concrete base was shaped and the cement-sand bed spread by the same

MINUS *the* SAND CUSHION

Owing to the many opportunities for errors both of omission and commission in constructing this type of road, the National Paving Brick Manufacturers' Association is now preparing accurate specifications covering the building of "monolithic" brick highways.

Rolling and Inspecting Brick Laid on One of the Edgar County Roads. A Hand Roller Is Used to Compress the Surface of the Pavement

operation. The template was drawn forward by the tractor-mixer as the latter moved backward after placing the requisite amount of concrete ahead of the template.

The concrete base was composed of one part of cement, three parts of fine aggregate and six parts of coarse aggregate, water being added until the concrete was of the required consistency—not thin enough to flow, nor too thick to manipulate with a template. The foundation, as constructed for the Edgar county roads, was four inches in thickness, with four inches of brick on top.

As soon as the base was shaped, the brick laying began. Ordinarily, in building this type of road, if the concrete is not too wet, the brick are laid directly upon the green base and are rolled at once. The roller is not to exceed thirty feet behind the template.

With this type of construction a heavy self-propelling roller would be destructive. A double cylinder hand roller, about thirty inches long and twenty-four inches in diameter, and loaded with water so that it weighs about eight hundred pounds, gives the best results with a plastic base. Such a roller levels the brick and gives them a sufficient contact with the mortar bed to effect a complete union between the two, at the point of contact.

SKILL REQUIRED ON PART OF DROPPER

The laying of the brick requires some care on the part of the dropper and celerity on the part of his helpers. As the brick must be laid before the concrete base begins to set, extensive culling and pulling of brick are not practicable. The brick carrier must reject obviously defective units and must place the brick in the way most convenient for handling. The dropper must put them properly in place, with the best side uppermost and all lugs in the same direction. The "batting" of courses must also be done expeditiously, the broken edges of the "batts" being placed away from the curb lines, so that the bond may be stronger and the edges of the pavement may be smooth and even.

Culling of brick in the pavement cannot be delayed. Indeed, one of the merits of this type of construction is that all work must be done promptly and none of it be allowed to fall behind constructional work ahead of it.

STANDARD SPECIFICATIONS FOLLOWED IN GROUTING

The method of grouting this type of pavement follows standard specifications. The filler is a 1 to 1 mixture of cement and sand, first thoroly mixed dry in a pan or by a small mixer, and then brought to the desired consistency by the gradual introduction of water. The mixing may be done in a grout box of suitable construction or in a small batch mixer, in batches of not to exceed two cubic feet each. If the box is used the mixture should be stirred constantly until it is all used. The filler should be scooped out of the box with a shovel and poured into the joints. Dumping the grout is strictly forbidden. If the grout is prepared in a small batch mixer, it must be put on the pavement by means of a spout attachment.

The excess of the first coat of grout should be broomed into the joints, care being taken not to allow their bridging.

The final course of grout should be somewhat thicker than the first, yet not thick enough to bridge joints. On this course the joints should be filled flush by the use of a squeegee operated at an angle of 45 degrees with the joints.

After the grouting was completed on the Edgar county roads and the initial set had taken place, an inch or more of sand or earth was spread over the pavement and sprinkled so that the grout filler could not set too rapidly. This blanket was allowed to remain in place for five days, and the road kept closed to traffic for fifteen days.

The forms used in constructing these pavements were removed two days after the grout had been applied.

As this type of pavement requires no curbs or edgings for highways, no longitudinal expansion joints were needed. Of course, transverse expansion joints are no longer tolerated by experienced engineers, as the use of such joints is equivalent to deliberately building weak spots into a pavement and making its failure a foregone conclusion.

UNIVERSITY OF ILLINOIS TESTS FAVORABLE

The successful practical construction of monolithic pavements at this and other points, has opened up a new field of theoretical engineering investigation. Whenever materials are combined to form an engineering structure, there enters the problem of economically distributing them in order that the structure as a whole may benefit most advantageously by the individual properties of the several elements. Thus, in monolithic brick pavements, the surface is composed of a material well adapted to resist attrition and compression, supported and held in place by a material well fitted for its purpose. Economic design then demands an equitable adjustment of these two elements in order that maximum serviceability may obtain with a minimum expenditure of money.

The mechanical properties of pavements have been too little understood in the past, and the tests conducted by the University of Illinois, being the first performed upon this type of construction, are worthy of careful study. Tests in bending were performed upon four slabs built as follows:

No. 1. Three-inch brick were laid upon four inches of 1-2-4 concrete, upon the surface of which was spread a one-eighth-inch layer of 1-5 dry mixture of sand and cement to provide a smooth surface upon which to lay the brick. Joints between the brick were filled with 1-1 cement grout. The slab was allowed to harden for twenty-four hours and cured with damp sand for twenty-seven days thereafter. Upon completion of the slab, the outside dimensions were 23x45 inches with a total depth of $7\frac{3}{16}$ inches.

No. 2. Similar to No. 1, but four-inch brick were used in place of three-inch as in No. 1.

No. 3. Four-inch brick were laid upon a one-inch base of 1-3 dry mortar. The dimensions of the slab agreed with those of Nos. 1 and 2, excepting the total depth which in this case was 5 inches.

No. 4. This slab was constructed seven inches thick, of plain concrete, intended to represent standard concrete pavement construction.

These slabs were tested in bending at an age of twenty-eight days, with a forty-two inch span, the load being applied upon the one-third points, resulting as follows:

Slab No.	Total Load	Modulus of Rupture
1	13,100	465
2	21,500	580
3	6,700	490
4	12,500	460

COMMENT ON TESTS

Slab No. 1. The fracture extended squarely thru the brick and concrete, in the first three rows of brick. For the remainder of the width, there was a slight separation of the brick and concrete evidenced by the different planes of fracture of the brick and concrete.

Slab No. 2. This slab showed a square fracture thru the brick and concrete for the entire width of the slab. There was no separation of the brick and concrete.

Slab No. 3. This slab also showed a square fracture for the entire width.

GENERAL CONCLUSIONS

While the number of tests were inadequate to form conclusive evidence for the formation of definite conclusions, nevertheless certain points may be drawn justifiably.

1. That it is possible to develop a sufficient bond between the brick and concrete to withstand all ordinary deflections of the pavement.

2. That altho there was no bond failure between the brick and concrete, there was a distinct line of demarkation between the concrete and the layer of sand and cement spread on the surface, upon which the brick were laid. The tests served to show the desirability of increasing the richness of this dry mixture to at least a 1-3 in place of the 1-5 mix used.

These tests were performed at the University of Illinois under the direction of Mr. C. C. Wiley, instructor in highway engineering, and are a portion of a series of tests being carried on in the same line of investigation.

While the monolithic type of brick pavement has many excellent features and will no doubt be used to a large extent in laying future brick roads, it is hardly logical to assume that it will entirely replace the pavement with a sand cushion. Regarding this point Secretary Will P. Blair, of the National Paving Brick Manufacturing Association says:

"No one can question that brick pavements, constructed in accordance with directions which provide for a sand cushion immediately underlying the brick, have shown most satisfactory results. Many examples of such streets show but a slight impairment from any cause, regardless of age or traffic. The faulty ones are the direct results of a departure from a failure to comply with the details of construction generally recognized as essential.

"One of the things seldom accomplished is proper compression of the sand cushion. It is so difficult to get it done that many are willing to hazard sufficient resiliency for protection to the pavement by leaving it out altogether. It has one function, and only one—that is, to relieve the shock due to impact in the use of the pavement and to furnish a uniform support to the overlying monolith. A requirement to fill up and roll and refill for at least three times, is a necessity in order to obtain a uniform and sufficient support.

MONOLITHIC CONSTRUCTION NOT NEW

"I am well aware that mortar beds under the wearing surface of pavements are neither new or novel. Their use by past generations was not handed down to us in sufficient detail to pass judgment upon them. Our experience therefore is very limited. In recent years but few mortar beds have been tried under brick and stone pavements.

"The most interesting example with which the writer is acquainted is a small alley leading to a freight yard and warehouse in the rear of a wholesale establishment. The brick were laid upon the green mortar bed of concrete made with seven parts of course aggregate and one part of cement. The brick surface was made smooth, by the use of a rammer on a board placed upon the pavement. The joints were then filled with 1-1 cement-grout filler, as provided in our present specifications. This pavement has been subject to frequent as well as heavy traffic for more than ten years. It is in almost perfect condition, and shows no impairment whatever from thermal, traffic, humidity or frost effect.

"It has been found that the resiliency of well-grouted brick pavements on a sand cushion ranges between 0.0003 and 0.0100. Considering it to be a fact that no brick in such pavement have ever suffered serious injury from shock, the question naturally arises, will injury result from shock in case the pavement slab is doubled in depth? We have in mind a monolithic structure which includes four inches of foundation, which structure, of course, will have less resiliency than the thinner slab."

The New York State School of Clayworking and Ceramics

Charles F. Binns, M. Sc., Director

Earle T. Montgomery, E.M. in Cr.E., Assistant

"PACK YOUR BOOKS"

for the

NEW YORK STATE CERAMIC SHORT COURSE

"School" Opens April 17 and Continues Four Days, With Some Very Excellent Teachers

SOME IDEA of the many good things that are in store for those who attend the short course of ceramic engineering to be held at the New York State School of Clayworking and Ceramics, Alfred, N. Y., from April 17 to 20, may be gained from the program which follows:

Monday, April 17

1. Address of Welcome—Dr. Boothe Colwell Davis, President of Alfred University.
2. Origin and Classification of Clays—Prof. Heinrich Ries.
3. The Chemistry of Clays and Other Ceramic Raw Materials—Prof. A. V. Bleininger.

Tuesday, April 18

4. The General Geology and Examination of Clay Deposits—Prof. Heinrich Ries.
5. The Physical Properties and Testing of Clays—Prof. A. V. Bleininger.
6. The Theory of Pyrometry—Prof. W. A. Titsworth.
7. The Physical Chemistry of Seger Cones—Prof. C. H. Milligan.
8. The Occurrence, Composition and Properties of Coal—Prof. Heinrich Ries.
9. Sampling and Analyzing Flue Gases—Prof. C. H. Milligan.

Wednesday, April 19

10. The Shaping of Clay Wares—Prof. Chas. F. Binns.
11. Drying Clay Products—Prof. A. V. Bleininger.
12. Drying Clays in Sixty Minutes—Mr. Harold Copping.
13. Burning Clay Wares—Prof. A. V. Bleininger.

14. Defects in Brick Manufacture Arising from Chemical Composition—Prof. Chas. F. Binns.

15. The Manufacture and Testing of Refractories—Prof. E. T. Montgomery.

Thursday, April 20

16. The Evolution of White Ware Bodies—Prof. Chas. F. Binns.

17. Types of Slips and Glazes—Prof. A. V. Bleininger.

18. Glaze Faults and Their Remedies—Prof. Chas. F. Binns.

19. Pottery Plaster and Molds—Prof. E. T. Montgomery.

20. Possibilities in Art Pottery—Prof. Chas. F. Binns.

21. Factory Accounting and Efficiency—Mr. F. T. Owens.

The sessions will begin at 2:00 P. M., April 17, and at 9 A. M., on each of the other days of the course. Recess will be taken each day from 1:00 P. M. to 2 P. M. and sessions will be brought to a close at 4:00 P. M. Each lecture will be of approximately one hour's duration.

It is hardly necessary to comment on many of the speakers, such as Professors Binns, Montgomery and Bleininger. The appearance on the program of the names of those authorities in clayworking, speaks for itself. It is, however, noteworthy that Dr. Heinrich Ries will deliver several lectures. Dr. Ries is head of the Department of Geology at Cornell University, and has written nearly all of the New York state and national geological survey reports on clays. Since he is not as well known personally to clayworkers, as are many of the other speakers, the forthcoming short course will be a special opportunity for those who are present to meet him.

While the short course is set for a date which is somewhat later than in other years, it is hoped that this fact will not keep many from taking advantage of the opportunities which it offers. It is suggested that where it is impossible for the plant owner or his superintendent to be present, that he send his son or some promising young man on the plant, to hear a series of lectures that will be well worth while.

Professor Charles F. Binns, Director of the New York State School of Clayworking and Ceramics, states that his school is desirous of co-operating in every way possible with ceramic products manufacturers and with this thought in mind, the faculty has prepared an unusually attractive program to meet the needs of the practical men in the industry. The lectures will be sufficiently non-technical so that all can derive an equal benefit from them. The work will be informal and conducted in the spirit of mutual co-operation.

The cordial support of every manufacturer is asked to make this short course a success and a permanent institution at the school.

Statement of Ownership

Required by the Act of August 24, 1912
Statement of the Ownership, Management, etc., of

Brick and Clay Record

published semi-monthly at Chicago, Illinois.

Editor

Frederic W. Donahoe..........Chicago, Ill.

Business Managers

H. H. Rosenberg..........Chicago, Ill.
David B. Gibson..........Chicago, Ill.

Publisher

Kenfield-Leach Company..........Chicago, Ill.

Stockholders

Owning 1% or more of the total amount of stock.

F. B. Cozzens	445 Plymouth Court, Chicago.
H. H. Rosenberg	" " " "
S. J. Leach	" " " "
L. W. James	" " " "
F. J. Sauer	" " " "

Known Bondholders, Mortgagee and Other Security Holders

None

(Signed) Frederic W. Donahoe, Editor.

Sworn to and subscribed before me, this 22nd day of March, 1916.

Anna M. Phillips, Notary Public.
My commission expires Jan. 25, 1920.

Ohio Makes Big Brick Paving Plans

Extensive preparations are under way for considerable paving in Cleveland, Ohio, and thruout the Buckeye State. In nearly every instance so far, where contracts have been let, brick will be used.

A campaign conducted during the past three or four months by the paving-brick manufacturers and the excellent representation made at the Complete Building Show have worked to the advantage of the manufacturers.

One of the best results of this propaganda is seen in the decision of one hundred business men in Columbiana county to pave that part of the Lincoln Highway from East Liverpool to Salem, Ohio, with brick. The distance between these two points is about twenty-five miles.

In Cleveland, the first letting of spring work has been passed, and to the satisfaction of local manufacturers, all of this work will involve brick. This first series of contracts calls for 84,000 square yards, and while the amount of material involved is not large, it is taken as a favorable indication of the attitude of city officials.

Ten miles of brick roads probably will be built this spring in Montgomery county, Ohio. All of these roads radiate from Dayton. State aid to the extent of $70,000 is asked, and this, it is expected, will be granted.

Paper Shortage Threatening

While paper does not play an important part in the manufacture of clay products, it might be interesting to the brickmaker to know that in the very near future it is going to cost him more to write a letter than it does now, or did a few months ago.

Due to the shutting off of wood pulp imports from Norway and the exportation of linen and cotton rags from England, the price of all kinds of paper, from the seemingly insignificant envelope to that used in the newspaper, is constantly rising. The Department of Commerce at Washington, D. C., has issued a notice which sounds a warning to every one to save waste paper and rags.

The attention of the department, it states, is called by the president of a large paper manufacturing company, to the fact that there is a serious shortage of raw material for the manufacture of paper in this country. This manufacturer urges that the department make it known that the collecting and saving of rags and old paper will greatly better the conditions for American manufacturers. Something like 15,000 tons of paper and paper board are manufactured every day in the United States, and a large proportion of this, after it has served its purpose, could be used over again in some class of paper. Much of it, however, is wasted. This, of course, has to be replaced by new materials.

THE DESIGN *and* CONSTRUCTION *of* CONTINUOUS KILNS

Some Clarifying Notes on a Much Misunderstood Piece of Clay Plant Equipment Which Had Its Origin in Europe

By A. F. Greaves-Walker

Author of "The Design and Construction of Down Draft Kilns," "Setting Down Draft Kilns," "Running a Plant to Capacity" and "Dies for Hollow Ware."

ALTHO THE CONTINUOUS KILN has been used successfully for considerably more than a half century in Europe, it is still looked upon by the vast majority of American clay plant owners as an experiment. Nor does this idea disappear as rapidly as would be expected with the ever-increasing knowledge on the subject. As soon as a clayworker becomes a convert and decides to build a kiln of this type, his neighbors, or at least many of them, immediately begin to figure about how long he can remain in business before the receiver steps in. They are not without justification in taking this attitude, but have very good reasons.

The continuous kiln was first brought to the attention of the American clayworker by Europeans who claimed to be kiln engineers and to have some particular design of kiln which was their own and which would produce marvelous results. These men were more often than not, simply brick masons who had helped to build a kiln or two, or burners who had operated them for a short period. The clay products manufacturers which these men managed to interest were the large plant owners of that period. This same type of clayworker is still the man most interested in the continuous kiln. Now, the conditions with which these kiln builders were confronted on this continent were entirely different from those in Europe. Instead of kilns of ten thousand daily capacity, those of from twenty to fifty thousand capacity were required, and these European brick masons, not being engineers, or at the most having a very limited training, were not equal to the occasion.

They did build kilns, but in such a way that the continuous kiln received a "black eye" from which it is still convalescing. Not only were most of these early kilns improperly designed, but the construction was worse than bad and many of them literally fell to pieces in a few years. Very few of those that did stand up to the work gave the

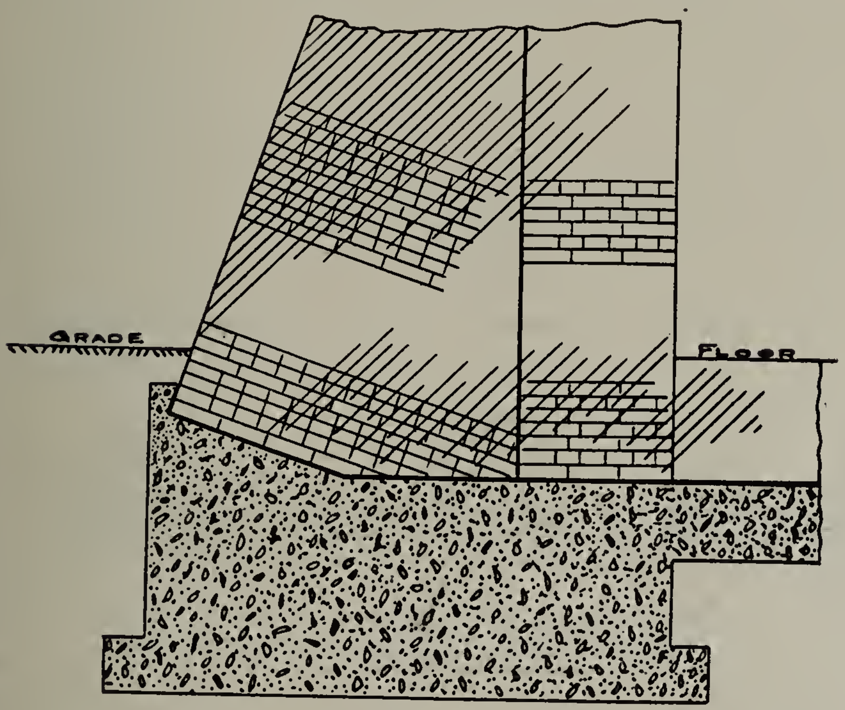


Fig. 1 – Correct Construction of Foundation For Batter Walls.

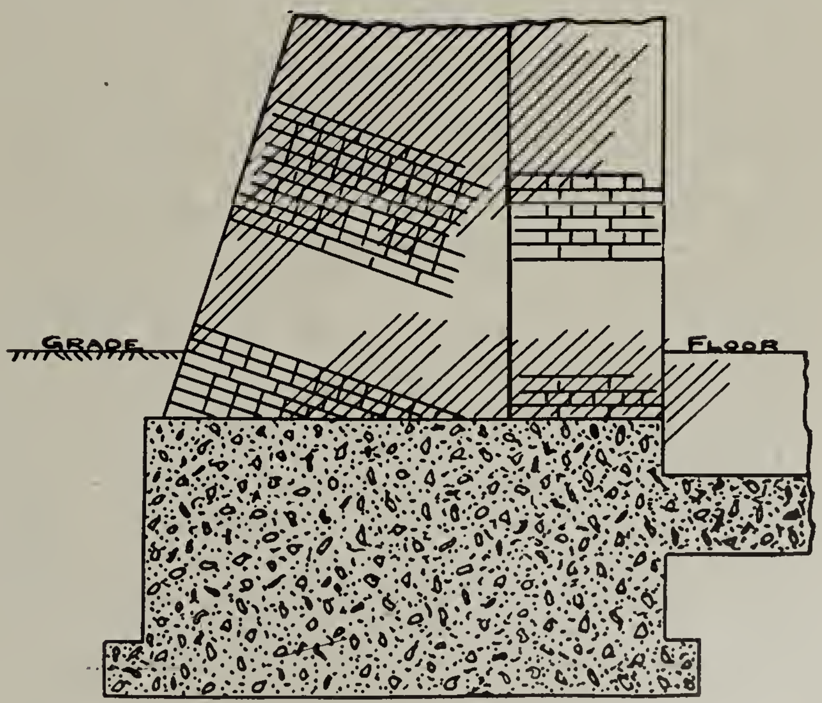


Fig 1 – Wrong Construction of Foundation For Batter Walls

results that were expected of them and, for a long time, it was thought that, while this type of kiln might be successful on small capacities, it would not do for large ones.

Another condition that has retarded the use of this kiln on the American continent is the fact that most of the information—in the shape of articles—that has come to the clayworker's attention has originated from European sources and has dealt with European methods and results. These articles make very interesting reading, but they have little effect in bringing the average clay plant owner to the point where he is willing to invest from forty to one hundred thousand dollars in a kiln.

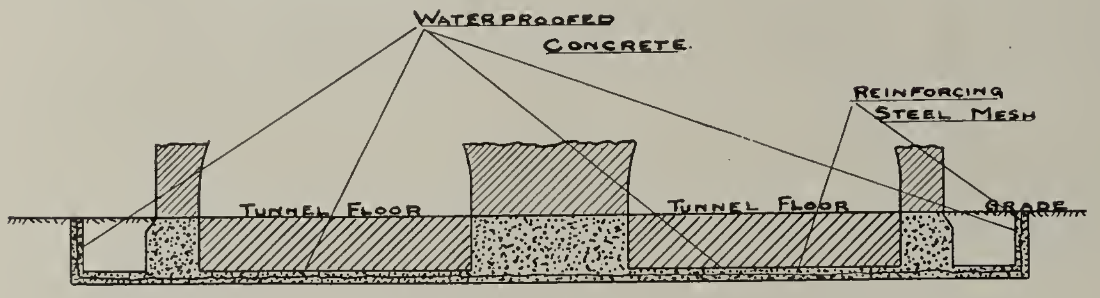


Fig 2 — Method of Constructing Waterproof Bottom.

As has been said, the great difference between American and European practice is the size of the units required. The small European unit was absolutely useless on this side and it therefore became necessary for the American engineer to solve the problems of the large unit. That he has solved this problem any man must admit who will look around with an open mind.

This perfecting of the kiln design, however, was not accomplished without great expense and trouble to the clayworkers who did the pioneering. The solving of large problems always costs money and, in this instance, the clayworker "paid the freight." This again acted as a setback to advancement.

It is the usual American practice for the clay products manufacturer to construct his own kilns whether they be clamp, down-draft or continuous kilns. While this practice has developed some very good designers and builders of down-draft kilns, it has produced very few men who know anything about either the design or construction of the continuous type. On the other hand, Europe has developed many first-class continuous kiln experts—men who can design, construct and operate a kiln, and turn it over to the clay plant owner in first class operating condition. Conditions, however, are rapidly improving on this continent in the direction of design, and kilns are now planned which will give perfect results under specified conditions, providing they are properly constructed and handled.

CARELESS BUILDING SPELLS DISASTER

Here the important question of construction comes to the front. Having created the condition under which he is his own down-draft kiln builder, the clayworker must now study continuous kiln construction. It is perfectly safe to say that fully ninety per cent of the troubles encountered in the continuous kiln as it is built today, are due to constructional faults and not to faults in flue design as was formerly the case. How to impress the clayworker with the fact that the "thrown together," cheap, slipshod methods that have been used in down-draft kiln construction will not do in the building of a continuous kiln, is a problem. *That he must be impressed with that fact* in order to save himself and the industry from further losses, is certain. A glance at some of the continuous kilns only recently built, to say nothing of those which are now several years old, will be enough to convince anyone of their unstable construction.

The clayworker has not always been to blame for this, as in all probability, plans were closely followed. But a little thought and investigation would have convinced him that the designers had given little consideration or cared little about the results the kiln would give after a few years of service, or what the repair bill would be. Some of the poor construction has been due to the vicious practice of letting the work out on contract—*to the lowest bidder.*

There is no sort of construction known that offers better opportunities for "skinning" than a continuous kiln with its heavy walls and underground work. Some of the work done in this line has been criminal and many clayworkers are today bemoaning the fact that they did not know more about building when their kilns were erected.

The cost of a continuous kiln ranges from $25,000 to $300,000 and the clayworkers investing such amounts have every reason to expect that they will be permanent. If the same amount was to be expended in a modern building there would be no question whatever about the proper design, construction and inspection, yet in the case of a kiln, these things are admittedly neglected, and this in spite of the fact that no other type of structure is subjected to such strains and "punishment."

Continuous kilns with advancing fire are of two types—gas-fired and coal-fired. Each type is built in two forms—chamber and tunnel. All of the continuous kilns in this country fall into one of these classes, no matter by what name they may be known. There is very little difference in the construction details of the various forms, altho the gas-fired kilns are the most complicated. Some of their features will be treated separately.

GOOD FOUNDATION VITALLY IMPORTANT

In designing and constructing the foundations of a continuous kiln two important points must be borne in mind, first, the weight of the structure, and second, its continual movement. When calculating the load the foundation will have to carry, the figures must always be based on the kiln filled with ware. During operation, there are some empty chambers but often, when closing down, the kiln is completely filled. *It is never safe* to figure on a load of less than one hundred pounds to the cubic foot, and it is much safer to figure one hundred and fifty pounds. The valley bottoms, on which kilns are generally located, are often composed of sand, sandy clay or clay washed from the hillsides. Very often these materials offer a very treacherous support for a heavy structure, especially *when every effort must be made to prevent unequal settling.*

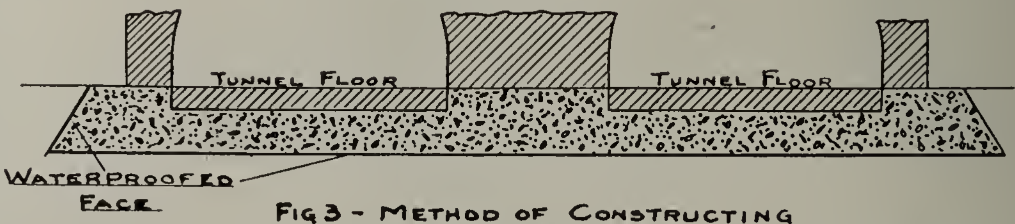


Fig 3 - Method of Constructing Waterproof Bottom.

If a shale or rock bottom cannot be reached without incurring great expense, an engineers' table should be consulted to find the *allowable load for the type of material on which the kiln is to be built.* With this data and the weight of the kiln at hand, it should be a simple matter to figure the area which the foundation must cover in order to properly support the kiln. In cases where very soft ground is encountered, it is sometimes necessary to build a "raft" of concrete on which the structure will "float." This, of course, is very expensive but, in many cases, it is the best kind of an investment. Should there be any doubt whatever in the mind of the plant owner as to what load the ground will safely carry, a reputable engineer should be consulted.

A clayworker should never accept the foundation plans furnished by a kiln company or kiln builder *without checking them carefully.* Too often such plans are "standard" and were not drawn up with any reference to the particular job in hand. It will pay handsomely to be cautious.

A very bad habit into which kiln designers have fallen is that of considering only the walls as requiring foundation support. At times the floor and the flues beneath are built as tho entirely separate from the walls and as tho they were not expected to carry any load. This is a great mistake in any type of kiln, especially when it is built on soft ground. When the floors and flues of a continuous kiln are built in this way, the repair bill is likely to be staggering from the very beginning. A foundation heavy enough to support the flue walls, floor and ware *should always be provided* and should be part of the general foundation plan—not separate.

A mistake very often made in designing the kiln foundation is in not providing "backing" for the foot of the batter walls. By this is meant that the batter is started off on a smooth, flat surface with absolutely nothing to prevent it from shearing off at this point whenever it gets the expansion thrust. This is exactly what happens and there are many instances of these walls having moved from six inches to one foot from their original location. Fig. 1 shows a method of providing a footing for batter walls and also the usual, but wrong, method of starting off the foundations.

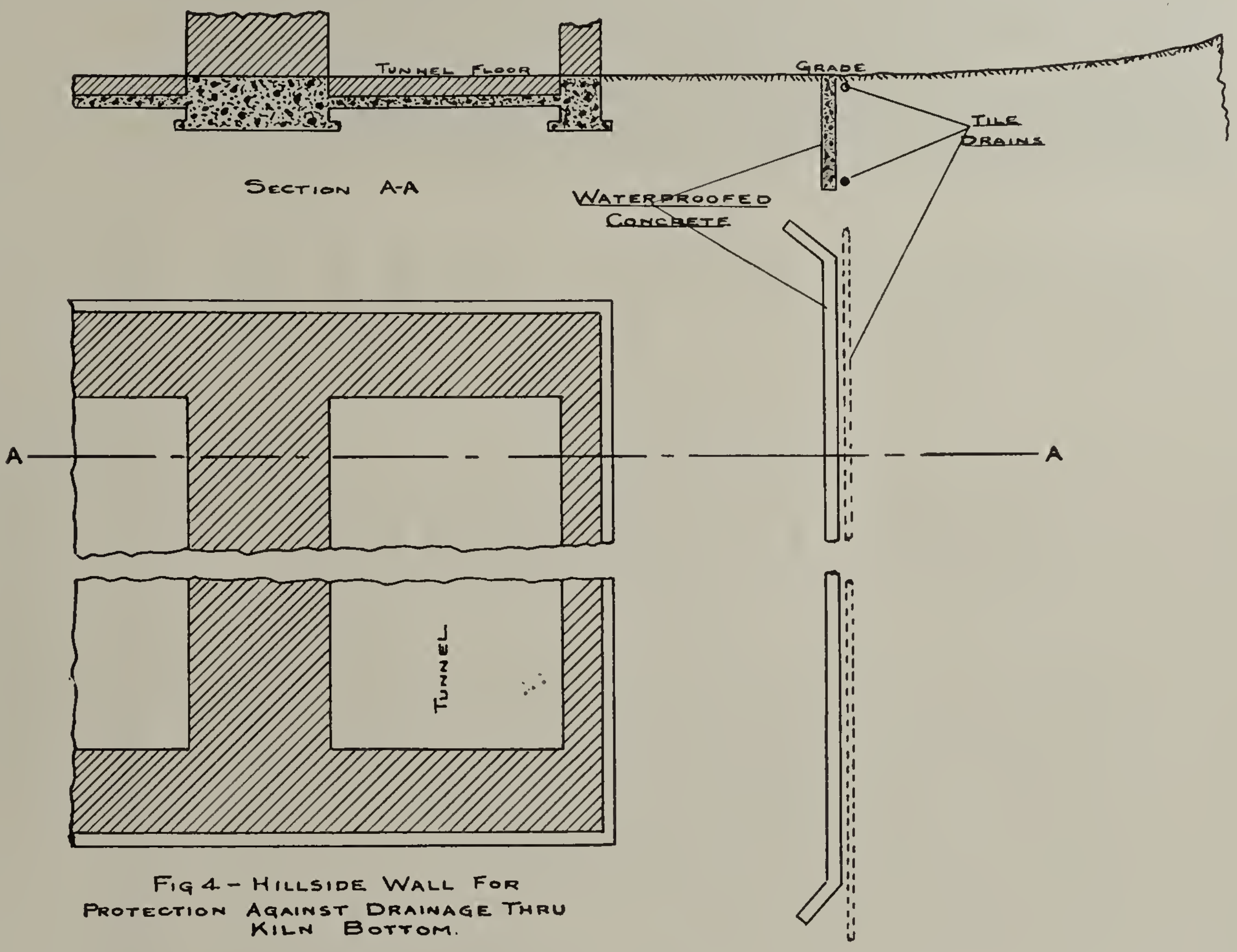


Fig 4 – Hillside Wall For Protection Against Drainage Thru Kiln Bottom.

Proper drainage of the bottom, always an important point in any kind of kiln construction, is doubly important in the case of a continuous kiln. To be successful, a continuous kiln must be capable of advancing rapidly and, if it does not do so, it is nearly always the bottom that holds it back.

A vast majority of kilns of this type are built with solid floors, and for this reason the clayworker figures that moisture under the kiln will not bother him. This is not the case, however. When the kiln is under fire, heat sufficient to evaporate water will penetrate to a depth of at least ten feet. The water vapor thus formed is constantly drawn into the kiln by the slight vacuum existing in the chamber or tunnel. Sometimes the amount of this vapor is sufficient to make it impossible to get from three to six of the bottom courses much beyond the salmon stage. It is not only the loss of this ware that is serious, but under such circumstances the burning speed of the kiln is greatly reduced and consequently fuel and labor costs are higher.

A kiln bottom should be thoroly drained to a depth of ten or twelve feet by running four-inch tile drains from eighteen to twenty-four inches apart over the whole bottom of the kiln. The more fall these drains have, the better they will do their work. They should never have less than one per cent. All laterals should be run into one main drain of sufficient size to take care of the entire drainage system and the upper end of this main drain should be connected to the main draft flues. This will insure a slight circulation of air in the system and prevent any vapor from rising to the kiln floor.

Kilns are often built in localities where it is impossible to get a natural fall for a drainage system without great expense. In such cases all of the drainage water should be run into a well or sump and a pump provided to keep the water below the proper level. The cost of running the pump will be paid a hundred times over by the increased capacity and the higher quality of the ware.

Where it is necessary to locate a kiln on gravel and in close proximity to a stream on approximately the same level, it is necessary to surround it completely with concrete walls and bottom, as shown in Fig. 2. This concrete work should be thoroly and carefully waterproofed. Another method is to build the entire kiln on a thick bed of concrete which extends far enough out from the walls to insure dryness in the chambers or tunnel. This method is illustrated in Fig. 3.

When a kiln is to be located so as to have a hillside on one side and a stream on the other, provision must be made to take care of the drainage water which is bound to flow from the hill to the stream. Besides a regular drainage system under the bottom, a concrete wall should be erected between the kiln and the hill. This should be built a little more than the full length (or width as the case demands) of the kiln and should extend from the grade line to a depth of fifteen feet. On the side of this wall which faces the hill a drainage system should be installed that will catch all water flowing towards the kiln and divert it. Fig. 4 shows a plan and cross section of such a system.

(*To be continued.*)

Veneer Mill of the Wheeler-Osgood Company in the Pacific Northwest

HOLLOW TILE

gets a

NEW CUSTOMER

Every day, almost, brings new uses for burned clay building materials. Here, progressive lumbermen have turned to burned clay as the only economical and fire-safe material for the buildings they are erecting. They, better than any other, know the fallacy of frail construction, and have used this knowledge to good advantage.

IN THE FAR WEST, among the pine-clad hills of Washington and Oregon, progressive lumbermen have found new uses for hollow-tile, principal among these being the building of dry kilns.

This wonderful country—first explored by Lewis and Clark in 1804—is familiar as a lumber-producing center to nearly every one, even the schoolboy and girl. The above-mentioned states, particularly, furnish a large portion of the annual production of that commodity in the United States, and so the cutting and drying of green timber is an important industry. It naturally follows that the construction and operation of dry kilns has furnished a subject for considerable study and experiment in this region, the results of which are of more than passing interest to the manufacturer of hollow clay building tile.

Various kiln designs built of different kinds of material have been tried with varying success, but the most striking results have been obtained with a type of kiln the number of which is rapidly growing in the Pacific Northwest and which is described herein.

One of the accompanying illustrations shows a typical North Coast dry kiln built for the Mineral Lake Lumber Company at Mineral, Wash. Its walls are constructed of hollow-tile eight inches in thickness with twelve-inch pilasters and laid on a concrete foundation. This is the third installation of this type of kiln made by this company, and in each case experience has proved this construction to be entirely satisfactory.

In dry kilns, as usually constructed, there is a large amount of heat wasted due to poor design and loose construction of the walls, a ramshackle wooden structure, carelessly put together, often being used for this purpose. But the escaping heat is not the only loss suffered in the use of poorly built kilns. The very fact that the heat in the kiln is constantly passing thru its walls, means an uneven temperature on the inside, which in turn results in checked lumber and a longer drying period owing to the operator's inability to get the maximum good from heat available.

In a kiln, the walls of which are built of hollow-tile, the insulating air spaces in the tile act as a barrier to the passage of heat thru its walls by radiation, thus producing an even temperature on the inside with a minimum expenditure of heat. The fact also that these masonry walls can be laid up so that they are air-tight, precludes the escape of heat thru cracks and crevices and so eliminates the source of an ofttimes considerable heat loss. It has been found that lumber dries very quickly in a kiln of this type with the smallest amount of checking.

Not only does hollow-tile make a money-saving dry kiln construction, but it also gives a fireproof structure, an advantage not to be undervalued in a lumber yard. That this feature is worthy of consideration was demonstrated a few years ago at the yards of the Baker White Pine Lumber Company at Baker, Ore. This company has a kiln built of hollow-tile and located in the southeast corner of its dry sheds which cover three and one-half acres of ground and in which were piled at the time in question a million and a half feet of select lumber.

A fire started in this lumber with the wind blowing from the north and almost directly over the kiln. Altho the flames completely enveloped this structure, it suffered no damage beyond two warped blocks and a badly scorched roof which was covered with patent roofing. Two doors on the south side of the kiln were entirely consumed by the flames. Meanwhile, on the inside of the kiln, the thermometer registered 192 degrees and no damage whatever was suffered by the lumber which was drying there.

Another instance in which the fire resisting qualities of hollow-tile in connection with lumber kiln construction were tested, was in the case of the Drayton Shingle Company at Blaine, Wash. This company originally had two kilns, having three long walls, the fourth being made unnecessary because of a common or middle wall between them. Two of these walls were built of concrete and the other of hollow-tile, both kilns being set out on piling on a bay located on the Gulf of Georgia. Sometime after being built, a fire occurred which completely destroyed the piling supporting the kilns, dropping these structures down into the water. When the company came to rebuild its kilns the same tile that had formerly been used were found to be in such good condition that they were again put into service in the new kilns which were built entirely of hollow-tile. The crumbled and broken chunks of concrete lying at the bottom of the bay contained no salvage whatever.

Practically the same thing happened at the new General Package Manufacturing Company's plant at Cosmopolis in the same state. This company had erected several kilns of tile which were located on piles standing out in the water. A fire destroyed the piling on which the kilns were built, depositing them in the water below. In rebuilding these kilns the same tile were used at a salvage of over ninety per cent.

In contrast to these two fires, the Canadian Western Lumber Company of Fraser Mills, Wash., which, by the way, is the largest sawmill in the world, had three kilns with concrete walls which went thru a fire, the walls being entirely destroyed. When these kilns were rebuilt hollow clay building tile was the material used.

So successful has been the use of hollow-tile in the construction of dry kilns in this region, that the insurance companies of Washington now allow a base rate on these structures when built of this material, the lowest rate being allowed on eight-inch tile walls with pilasters, or thirteen-inch solid walls. One manufacturer of clay products in this territory reports that in the past four years it has erected more than two hundred of these kilns, all of which have given great satisfaction.

However, the use of hollow-tile for structures employed in the manufacture of lumber is not confined to the Pacific Northwest. News of the success of this material, particularly for dry kiln construction, has reached other sections of the country, which has resulted in the building of hollow-tile dry kilns at many points.

The timber lands of Wisconsin is one of these sections, and here may be found an increasing number of kilns which have for their principal constituent hollow clay building tile.

The chief engineer of the Foster-Latimer Lumber Company of Mellen, Wis., has had some experience with this type of building and makes some very interesting statements regarding observations which he has made.

A Hollow-tile Lumber Dry Kiln in Use at the Plant of a Minneapolis (Minn.) Concern, Which Has Proven Entirely Satisfactory

A Typical North Coast Dry Kiln Built for the Mineral Lake Lumber Company at Mineral, Wash.

A little more than a year ago this company completed the construction of a hollow-tile dry kiln, the new structure being placed alongside of the old ones, using one wall of an existing kiln as a common wall for both that and the new kiln. The old kilns, which were built more than five years ago, were constructed of reinforced concrete with solid walls ten inches in thickness. A reinforced concrete roof four inches thick covered these old kilns, each of which was divided into three rooms measuring 104 feet long, 20 feet wide and 14 ft. high to the ceiling. The new hollow-tile kiln was built with a similar layout, with the exception that it was 25 feet instead of 20 feet wide.

On the morning of December 26, 1914, before the kiln was quite completed, the thermometer registered twenty-two degrees below zero as the outside temperature. The doors had been temporarily put in place by this time but were not sealed tight. They were made of lumber one inch in thickness. With this low temperature outside and the doors in this shape, Mr. Lundquist states that he placed the termometer inside the new kiln about in the center, four feet above the rails, and found that it registered 52 degrees above zero Fahr. No heat had been turned into the new kiln, the only other possible means of heating being the concrete wall of the old kiln which radiated enough heat to warm the air to the temperature above mentioned. This proved that there was an enormous loss of heat thru this wall, and probably more so thru the roof.

"Accordingly," said Mr. Lundquist, "I set to work at once and constructed a false roof of lumber and prepared roofing on top of the concrete roof, leaving a dead air space of three inches. This increased the temperature in the concrete dry kiln twenty degrees, using the same steam pressure and the same amount of radiation surface as before.

"Together with a representative of the Forest Products Laboratory of Madison, Wis., I have carried on an extensive test of the new hollow-tile kiln, covering a period of nearly two months. During this time we have had some very low temperatures, the lowest being forty-six degrees below zero. This temperature did not effect the inside temperature in the hollow-tile dry kiln to any marked degree. A loss of five degrees was noticed near the doors, but there was no radiation thru the walls. We threw water on the outside of the walls and it would freeze to the tile and stay there until melted off by the sun, proving that there was no loss of heat from this kiln by radiation thru its walls. This was done with an inside temperature of 180 degrees.

"We have had the temperature on the inside up to as high as 190 degrees and still the outside surface of the walls has always retained the same temperature as the outside air. The walls of this kiln are sixteen inches in thickness, plastered and painted on the inside, but not on the outside."

One of the accompanying illustrations shows a picture of a hollow-tile lumber dry kiln that is being used by a Minneapolis concern and which has proven entirely satisfactory.

The illustration at the beginning of this article is that of the veneer mill of the Wheeler-Osgood Company, a Northwest lumber concern that makes a specialty of sash and doors. The dimensions of this plant are 80x180 and it is built of eight-inch hollow-tile.

SWEDISH TILEMAKERS *discuss* WAR PROBLEMS

According to the "Berlingske Tidende," a large meeting was held by the Association of Swedish Tile Manufacturers at Stockholm recently. This meeting is of special interest because of the report of William Cranquist, editor of "Tegel," regarding conditions in the industry.

Dr. Cranquist informed the Swedish tile manufacturers that in the near future a change of considerable importance would probably take place in their business. The war has changed conditions in the coal industry. Most of this commodity in Sweden must be coked in order to obtain the ammonia, benzole and toluene for war purposes, with the result that the tile making industry has only a limited supply of fuel at its disposal. Coal prices have advanced considerably during the past few months. While there is an abundance of coke, manufacturers are getting short of coal and, owing to these extraordinary circumstances, are obliged to burn coke in their kilns.

Experiments which have been made at one of the factories in burning tile with coke instead of coal, have resulted very favorably. While it is claimed by many that there is nothing better than coal for the burning of tile, the experiments above mentioned have proved to the contrary. Dr. Cranquist informed the manufacturers who attended this meeting that it is entirely possible to burn coke in annular kilns, a type which is very commonly used in Europe, and with far more economy than when burning of coal.

However, there is one point upon which tile manufacturers must fix their attention, according to Dr. Cranquist, and that is on the percentage of water which is contained in the coke. Coke should not be purchased upon which a test for the water content and per cent of ash had not been made. It is possible for this material to contain forty per cent of water and ten per cent of ash, which means that only fifty per cent of available fuel remains. This percentage is too small and Swedish manufacturers have been warned to protect themselves by demanding a larger percentage of burnable material when purchasing coke.

Cincinnati Brickmakers See End of Strikes

A labor adjustment which, it is hoped, will mean the end of strikes in the Cincinnati building trades, has been arrived at between the Building Construction Employers' Association, representing the employers, and the Building Trades Council, representing the various labor unions. The trades affiliated with the council are the art glass workers, asbestos pipe coverers, cement finishers, composition and tar roofers, electrical workers, hodcarriers, hoisting engineers, iron workers, lathers, painters, plumbers, sheet-metal workers, steamfitters, stone cutters, tile-setters and slate and tile roofers; and under the agreement referred to, members of these unions will be employed on all jobs, and all jurisdictional matters will be settled by reference to the American Federation of Labor. Furthermore, grievances of a general nature will be settled by a board of arbitration which has been appointed. Questions of hours, wages, shop rules and conditions of journeymen will be taken care of by the respective unions and employers. With the numerous matters taken care of by the general agreement and the principle of arbitration adopted, it is certain that there will be much less trouble than there has been in the past.

Potters Oppose Freight Rate Advance

The action of the Western Freight Classification Committee in seeking to advance freight rates on pottery from twelve to forty-eight per cent is being opposed by the United States Potters' Association. The committee held a hearing in Chicago, Ill., recently when H. P. Knoblock, secretary and general manager of the Potters Co-Operative Company, with Frederick B. Lawrence, appeared before the committee and explained why the intent of the railroads was unreasonable. An extensive brief was filed. The carriers will announce their decision later. One of the interesting features of this hearing was the fact that the carriers attempted to specify the kind of packages in which pottery and earthenware should be shipped. It was brought out that an effort was being made to do away with the loading of ware in casks—a custom that has been followed ever since potteries were established in the United States.

A New Use for Brick

The Rotary Club of Pittsburgh, publishes a little paper which it calls "Live Steam." This publication "blows off" every week and the last toot on its whistle has to do with food values.

"As a guide for the calculation of the heat production in the body, the term calorie is used" says the author. "A calorie is that amount of energy necessary to generate one degree of heat as measured by the centigrade system. The following diagram, if kept in mind, will simplify the problem of the requirements of the body. For clearness and by way of illustration, suppose a bricklayer be building a wall—he needs material (bricks and mortar) and spends time and energy in accomplishing his task. These elements can be very aptly applied to foods and their functions as in the following diagram:

BRICK (protoids or tissue production)	TIME (Fats—or heat)	ENERGY (Carbo-hydrates)
20%	80%	
50 to 90 gms. in 24 hours 300 to 500 calories	530 to 850 gms. in 24 hours 2200 to 3500 calories	

Total calories (protoids, fats and carbo-hydrates) 2500 to 4000

"The above diagram is based on the requirements of an adult weighing 150 lbs. and doing an average amount of work. Those persons doing more physical labor require about fifty per cent more."

The PUBLIC GARAGE—*a* MENACE

Some Eye-Opening Facts from an Authority on Fire Prevention, Showing How the Use of Brick and Hollow-tile, with Judicious Designing, Would Do Much to Eliminate an Exceedingly Dangerous Building—the Average Public Garage as now Constructed

By E. Winfield Day

YOU HAVE A DUTY to perform in your town or city for its safety and betterment—and incidently for a more complete understanding with regard to the merits of your products for a very important type of building.

While you may not realize its presence, it is there just the same and consists of a warning to your fellow townsmen or citizens regarding the peril of the average garage as it is now being built. By garage is meant not so much the small building that finds a place on the back of a residence lot for the accommodation of one automobile, but the large or commercial garage, which houses several cars—a type of which is found even in the smallest town.

This building in many, many cases is built of wood, which in itself is an invitation to fire with its accompanying hazards. Further than this, however, and of still greater importance to the community, is an almost total lack of scientific construction, which presents a great menace in the liability of a disastrous explosion due to the presence of free gasoline vapors.

Some municipalities have ordinances or laws in the interests of the public safety which prescribe certain limitations to be followed in the building of a public garage. Others have nothing along this line, leaving a free hand to the garage owner to build just as dangerously as his foolishness and ignorance will allow.

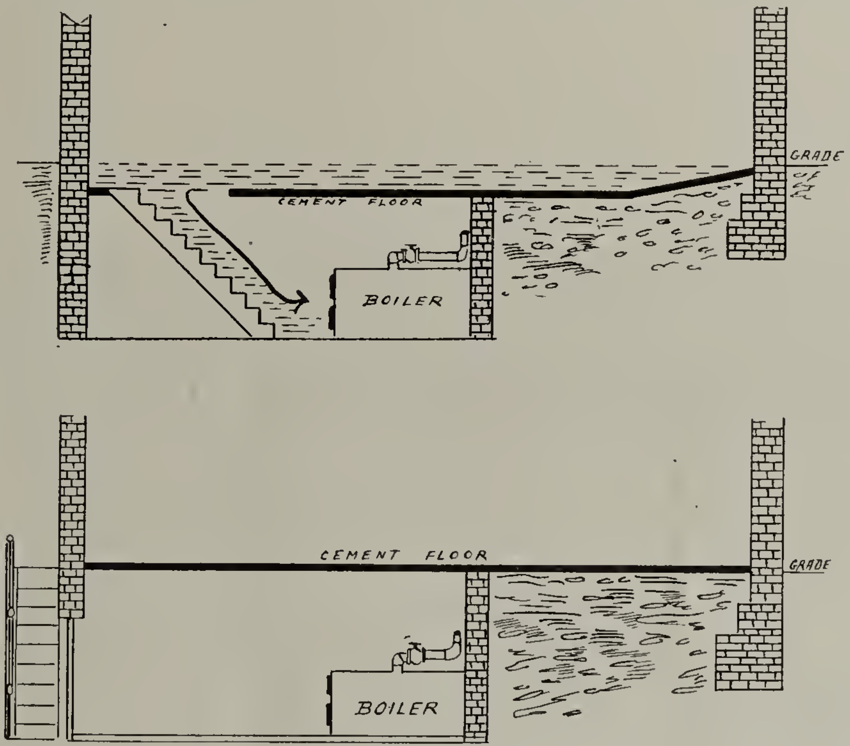


Fig. 1. Dotted Lines in the Upper Illustration Show Gasoline Vapor Pocket, While Arrow Indicates Vapor Flow to Boiler. In the Lower Illustration it will be Noted that the Floor is Slightly Above Level of Grade, With Stairs Leading to Outside of Building Only

There are two reasons why the clay plant owner should be interested in the kind of garages that are erected in his locality. First, because the building for housing automobiles that is not constructed without due regard for certain fundamental requirements, is a menace to the lives and safety of those living within a large radius. This is a big and broad-minded motive—one which will convince most anyone of the need of more drastic legislation covering the construction of garages. The second reason, while some may call it self-interest, is nevertheless of the utmost importance to the producer of burned clay building materials. It is that, with an intelligent use of brick and hollow-tile, these garages can be made to contain a minimum risk.

But why brick and hollow-tile? Because fire underwriters have found that the use of these materials in the combination suggested in the accompanying sketches, makes a garage that is as fire resistant as it is possible for one of these buildings to be. Furthermore, when used as shown on the accompanying plans, make a building in which the paramount danger of an explosion is almost eliminated.

Owing to the many serious fires and explosions which have taken place in garages and in automobile repair shops during the past several years, there has been a general awakening on the part of fire prevention engineers and underwriters thruout the country to the many hazards incident to this class of occupancy, altho many of the dangers inherent to the handling of gasoline and to the consequent presence of gasoline vapors, are not as yet thoroly understood and appreciated even among those actually engaged in the various branches of the automobile industry.

Probably no single branch of manufacturing has enjoyed a more phenomenal growth than this one. On every hand new garages are being erected, existing ones enlarged or old buildings being converted to that use. What applies to garages also holds true with service stations and repair shops. With the creation of each new garage, each new service station and each new automobile repair shop, there is introduced a hazard to life as well as to property—the severity of this hazard being dependent upon the degree of consideration which has been given to proper construction looking toward safety.

Before taking up the standards for garage construction, it is quite essential that the dangers of storing and handling gasoline be thoroly understood. Gasoline gives off inflammable vapors at temperatures below 0 degrees Fahr., but at higher temperatures gives them off with corresponding greater rapidity. When in a pure state this vapor is not explosive, but requires the presence of certain proportions of air to become so. According to the United States Bureau of Mines, explosions will not take place if there is less than 1.4 per cent or more than six per cent of gasoline vapor present in the air, altho mixtures containing greater or smaller proportions will develop considerable pressure. For this reason, and contrary to the general belief, a small amount of gasoline vapor can do a large amount of damage.

Further—since gasoline is about two and one half times heavier than air—its presence is particularly difficult to eliminate, the greater part of it settling along the floor so that ventilation at the floor level is the only effective way of disposing of it, other than by the use of mechanical means. In the light of this knowledge it is easy to see how a spark from the heel of one's shoe on a cement floor, is sufficient to cause an explosion, if the proper air and vapor mixture is present. The vapor from one pint of gasoline is sufficient to make two hundred cubic feet of air explosive.

There are, however, clearly defined and practical methods by which these ever-present dangers may be greatly lessened, and altho these may add a small initial expense to the cost of the garage, the matter of a few dollars should not outweigh the consideration of life and property.

All garages should be of fireproof construction, and in some cities this requirement is embodied in the statutes. A limitation of one story in height is a common restriction, or where more than one story is allowed, provision is made that all stairways, elevator shafts and miscellaneous floor openings be enclosed in self-supporting brick or tile shafts extending thru the roof and equipped with standard self-closing fire doors, except on the elevator shaft doors where an approved type of semi-automatic corrugated iron doors are acceptable.

A building of ordinary or slow-burning construction, equipped thruout with an approved system of automatic sprinklers, while offering numerous advantages, can hardly be considered the equivalent of a strictly fireproof, unsprinkled building, even tho the floor openings be enclosed in the same manner as in the fireproof structure. The reason for this is that in the fireproof garage, each floor is to all intents and purposes a separate building insofar as attack by fire is concerned, while in the slow-burning type, a severe explosion might damage the sprinkler system to such an extent as to render it useless in handling the fire that nearly always follows.

There should be no basement under a garage other than perhaps a small boiler room. The ground floor should in no event be below grade and so laid that there is no space underneath it. It is quite obvious that failure to observe these requirements would result in a continuous presence of a strata of gasoline vapor which would require the application of mechanical means to even partially remove and which, sooner or later, might be a source of disaster.

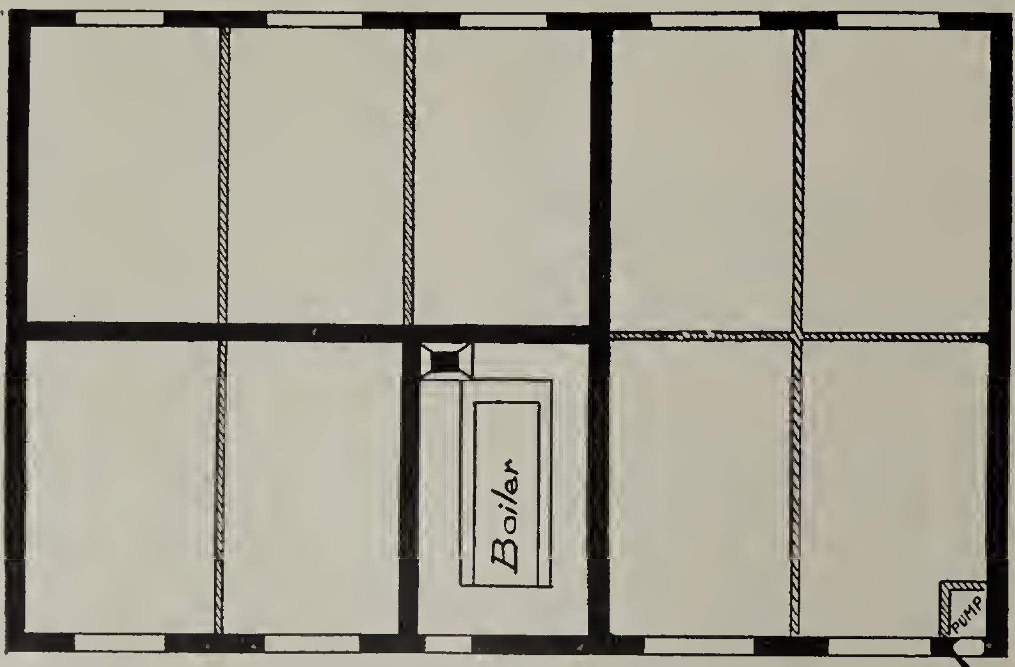


Fig. 2. Solid Black Lines Indicate Twelve-inch Brick Walls Thirty-six Inches Thru Roof. Shaded Lines Indicate Six-inch Hollow-tile Plastered on Both Sides. Each Section Is Large Enough to Accommodate One Automobile

In Fig. 1 of the accompanying illustrations is shown an improper and a properly arranged grade floor and boiler room. It might be mentioned at this point that the heating system should, under no condition, be any other than steam or hot water, the boiler being located in a fireproof enclosure of brick or hollow-tile with an arched brick ceiling, and having no communication except to the outside of the building. The use of stoves has been the cause of many garage fires, resulting in their prohibition in several cities. The boiler room itself should be no larger than necessary to accommodate the boiler and to provide adequate working space, altho additional space may be provided for storing coal. When this is done, the coal hole should always open to the outside of the building, never to the inside, as this would provide an opening for the gasoline vapor to enter the boiler room, communicating to and igniting from the fire under the boiler.

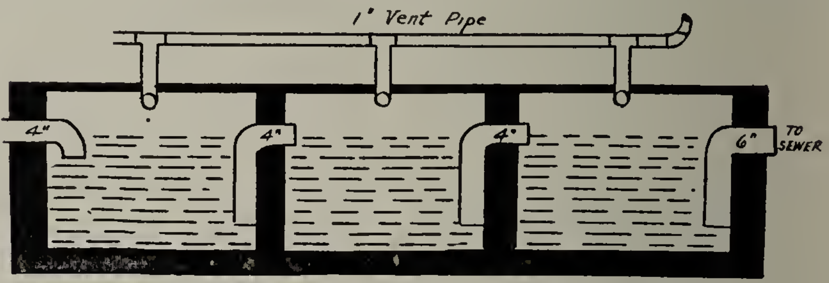


Fig. 3. Diagram Showing the Principle of the Triple Intercepting, Built with Brick Catch Basin for Garages

Another danger arises from the usual presence of open flame and spark devices such as soldering iron heaters, forges, blow torches and emery wheels on the same floor where automobiles are being repaired. These devices, of course, present a dangerous condition coupled with the presence of gasoline vapor. The most feasible solution to this problem is to select one floor in the garage or shop where automobile repairing is to be done and enclose a separate room on this floor with incombustible materials. The walls of this room should be built of four-inch hollow-tile plastered on both sides. This room should be well ventilated and have self-closing fire doors on all openings.

Electric motors are dangerous for the same reason as the above mentioned devices. They are best located about four feet or more above the floor level in the garage in order that the gasoline vapor strata may be surmounted.

All of the foregoing precautions would of course be unnecessary were it not for the presence of the gasoline. The proper methods, therefore, of storing and handling this highly volatile and inflammable liquid are worthy of serious consideration.

The gasoline supply tank should be properly buried (never less than two feet below the ground) and the tank should be vented by a pipe having a minimum diameter of one inch, and extending at least twelve feet above the ground, terminating in a goose neck. The pump itself should be on the grade floor, or above, near an entrance or other well ventilated place, and supply pipes between pump and tank should always pitch toward the latter without pockets or traps to enter. Such pipes should under no condition pass thru any room containing open lights or fire, unless solidly encased, but it is no unusual occurrence to find gasoline supply pipes running thru a boiler room, where a leaky joint spells calamity.

Happily, however, while garage hazards are not receiving a proper amount of attention in the country, the structural features are being improved and, whereas, only a few years ago a garage consisted of one large area, many are now being built in such a way as to confine a fire to one small section. In Fig. 2 is shown a common type of this late construction, the floor being of cement, the exterior walls brick and the partition walls of hollow tile with 12-inch interior blank brick walls carried three feet thru the roof, so as to form an absoute fire stop between each three or four sections. The roofs of these buildings are quite often of book tile.

Much could still be said in regard to garages, but in a general way the principle features, both of construction and hazards have been covered. The use of a triple intercepting catch basin as shown in Fig. 3 is not general, altho quite essential in garages where large amounts of oil-mixed water are passing directly into a public sewer. The principle of this catch basin is based on the fact that the oil and gasoline will rise to the surface of the water and the water passing into the next compartment from a low level will be considerably freer of foreign substance when it reaches this second compartment. By the time the water has gone thru all three compartments, it is practically clear.

There is little doubt but that ignorance—both on the part of the public and upon the part of the garage owner—is responsible for the great laxity that prevails in most localities with regard to the building of a garage. The public can be educated to see the danger of allowing a man to make a "bomb" which might be set off by the merest accident, resulting in great damage to property and loss of life—in greater proportion by his neighbors than on his part.

Some garage owners can by persuasion be made to see the unnecessary hazards they are placing upon the civic body in not building more safely and with due regard to the principles laid down in the foregoing paragraphs. Others are not so anxious to know the truth. However, they can be compelled to respect the lives and property of their neighbors by the passage of adequate legislation in every city and town where garages are built.

It is with this thought that this short appeal to the manufacturer of burned clay building materials, is brought to a close—an appeal for action that will not be without reward, first in the satisfaction of having done a public service, and second, in securing another opportunity to present the merits of clay products as fire-safe building materials.

Millions of Clay Marbles—Springtime Demand

It has been estimated by statisticians that more than 200,000,000 small clay marbles are used by the boys of the United States every springtime, says the La Crosse (Wis.) "Leader-Press." It is a known fact that 125,000,000 marbles are made every year by one clay marble manufacturer whose plant is in Summit county, Ohio. And these marbles are made or rolled by young girls.

The marble manufacturer does not devote all his attention to the manufacturing of the "game marble." There are various uses to which the marble is put, and as a matter of fact, the size varies according to its intended use. The Standard Oil Company is one of the largest buyers of marbles, and these are used for oil cans. Larger sizes are started in graded pipe lines to clean out the parafine which gathers in the pipe as the oil flows to the tanks.

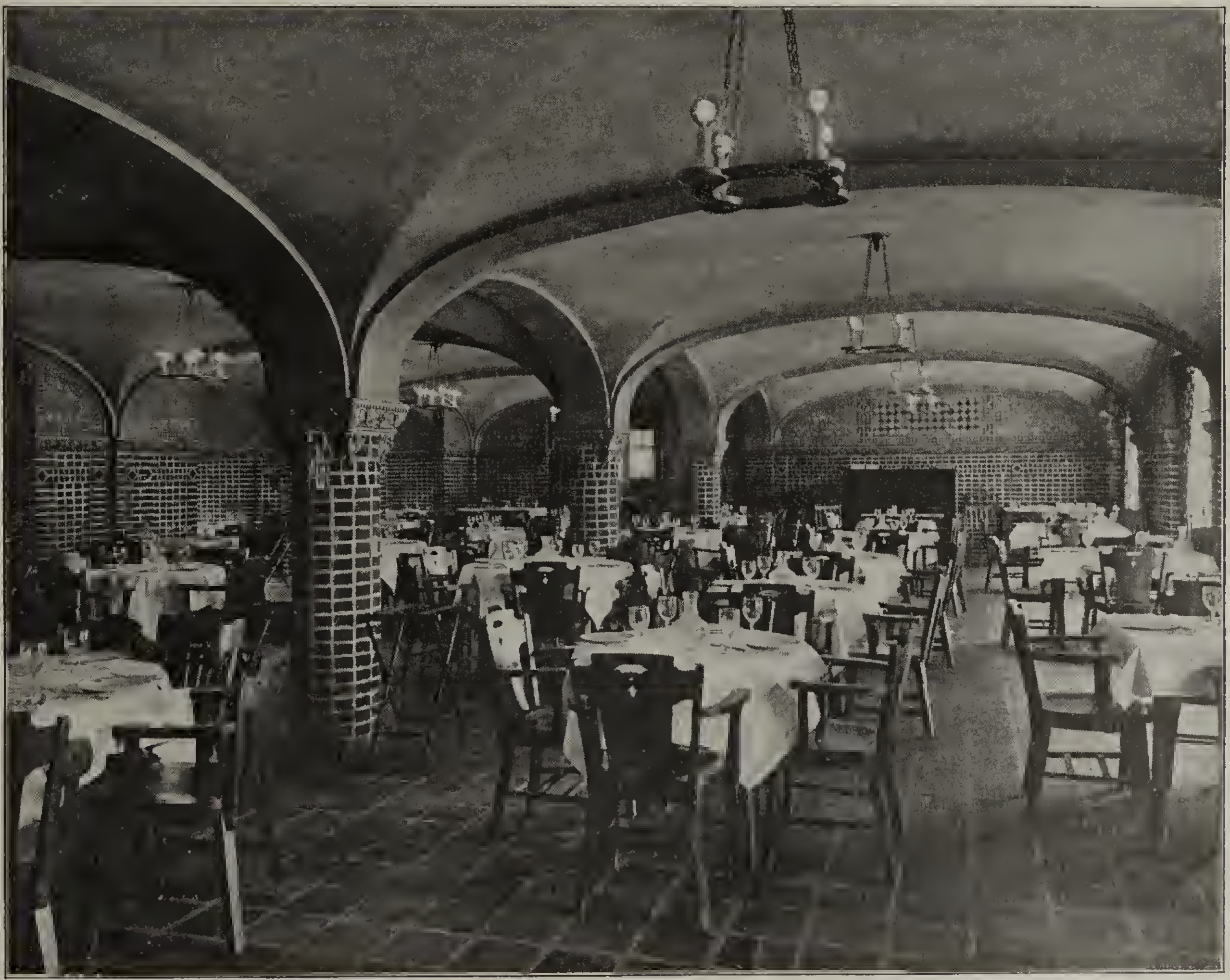
Clay marbles also are used by the manufacturers of rubber, ink and salt, chemical and powder makers. They are used also in grinding the large stones of the lithographer and by railway supply people. Puzzle box makers are also large buyers of marbles.

The sizes of the clay marbles as made in the United States vary from nine-sixteenths of an inch in diameter, which is the small "pill" the boys play with, to one measuring six inches in diameter, or about the size of a small cannon-ball.

A SILENT "BOOSTER" *for* BURNED CLAY INTERIORS

Lifeless interiors in lodge, fraternity and hotel grill rooms are slowly but surely giving way to more attractive and lasting schemes of decoration. The accompanying illustration shows one of these rooms that may well be called artistic. It is in the new Columbus (Ohio) Elks' Temple, the scheme of interior decoration being carried out in light brown, saffron and seal-brown rough-textured face-brick, while the floor is laid in twelve by twelve vitrified tile to match in tone the shades of the brick.

This treatment of burned clay blends with the draperies and furnishings, making a harmonious picture, which speaks volumes for a more extended use of brick in interior decoration.



BURNING *salt-glazed* SEWER PIPE

How a Practical Ceramist Attained Success in This Very Important Operation on an Ohio Sewer Pipe Plant

By George D. Morris, Cr.E.

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THE OBSERVATIONS and experiments enabling the writer to present these notes on burning and salt-glazing of sewer pipe, were made on pipe manufactured from shale clay, and the principles have also been applied to pipe manufactured from fire-clay.

The process for shale clay and fire-clay pipe can be divided into five distinct parts: first, water-smoking; second, heating up; third, oxidation; fourth, vitrification; and fifth, glazing. These steps overlap more or less when applied to both shale clay and fire-clay, altho each will be treated separately.

WATER SMOKING

Water smoking is one of the most troublesome periods and is of much importance to the manufacturer of the larger sizes and double strength sewer pipe. The period covers the time from the start until the ware has given up all of the mechanically combined water and some of the chemically combined. In practice, this would invariably mean that the ware was bone dry or a little more. A temperature of about 350 degrees Fahrenheit would be obtained during this stage.

Successful water smoking of large size ware in a down-draft kiln should be done by using the kiln as a down-draft kiln, starting with very small fires and gradually increasing as fast as that particular clay will permit. Do not use the kiln as an up-draft, leaving the covers off for any length of time after starting the fires, unless the kiln is especially adapted, as when the kiln is covered a sudden change will result, and this we are always striving to prevent during the burning of sewer pipe. The time of water smoking varies from 24 to 96 hours, according to the size of the ware or difference in clay. A few of the effects of too rapid water smoking are as follows: scaling or blowing, blistering and cracked sockets. By scaling or blowing we refer to cases of large slabs blown off and found lying on floor of kiln. Too rapid firing causes the outside to dry faster than the inside and the unequal shrinkage causes the part drying fastest to break loose. Blistering is very common in clays that laminate. When the mechanically combined water is driven off, it collects under the layers of clay or blister formed during the pressing of ware, and if the water smoking is too rapid, the steam or gas will collect in these pockets, causing them to swell and sometimes to break open, forming scales on the pipe. In down-draft kilns the pipe on the bottom are subjected to greater humidity or dampness, and we find on the bottom rows of pipe, the largest percentage of blisters. Cracked sockets is a common trouble when using excessive draft during water smoking. Currents of air are set up thru the ware from excess draft, and the sockets dry faster than the body of pipe, causing a strain in the sockets which finally produce cracks. All of the troubles that arise in the water smoking generally occur in layers. The heat travels downward in layers, and we may have scaling or cracked sockets on the top pipe and none on the bottom, or vice-versa. Too rapid firing at the beginning will cause trouble with top pipe, too slow beginning followed up by too rapid firing causes the trouble to occur on the bottom pipe. Many times it is necessary to increase the stack draft, by starting fires in the stack to warm them. Whenever the kiln bottom is very damp at the start of a burn, a built-in firebox in the stack is a very convenient arrangement for warming the flues, thus having a good draft at once.

HEATING UP

Heating-up covers the time from water smoking to oxidation. In practice, it overlaps the other steps, as it is sometimes rather hard to designate without the assistance of a pyrometer. The heating-up period ranges from 350 to about 800 degrees Fahrenheit. In most plants, the drying is carried on gradually; and by giving plenty of time, oxidation starts at a low temperature, therefore not much time is left. If given special attention, a period can be produced where the temperature can be raised very rapidly from 350 to 800 degrees Fahrenheit without proving injurious to pipe. The following is a schedule for burning large size pipe at one of the large shale sewer-pipe plants:

Water smoking	0 degrees	to	350 degrees	in 72 hours.
Heating-up	350 degrees	to	800 degrees	in 24 hours.
Oxidation	800 degrees	to	1,400 degrees	in 84 hours.
Vitrification	1,400 degrees	to	2,100 degrees	in 48 hours.

As this period is overlapped by the preceding and following periods, we will not dwell on it, as it is not altogether practical unless used by one of more than the average fireman's knowledge of burning.

OXIDATION

Oxidation is a period of great importance to successful burning of shale clay high in carbon but is usually not of great importance to the fire-clay manufacturer except for the large sizes. Incomplete oxidation is very injurious to pipe, giving them a spongy interior, distorted shapes and inferior ring. The common supposition is, that incomplete oxidation is due to improper drying and to remedy, a day or two days are added to the water smoking period. The result from such practice is that one kiln is well oxidized; and in the next one, the same old trouble will appear again. The best, easiest and surest way is to adopt our good friends', the brickmakers', "draw trial" system, and then with ordinary care, anyone can insure perfect burns as far as the complete oxidation is concerned. Draw trial should be made of the shoulder of pipe, which is the thickest part. The draw trials are placed near the door of kiln, so that on removing some of the brick from the door, the draw trials can be easily taken out. When the temperature nears 1,000 degrees Fahrenheit (or just a little red at dusk), the progress of the burning out of the carbon can be noted. The trials are then drawn at regular intervals, until oxidation is complete. The temperature may be gradually increased up to about 1,300 degrees Fahrenheit, and then held until trials are clear of carbon.

VITRIFICATION

The vitrification period follows close upon oxidation, and if the oxidation is not completed before vitrification starts, there is little chance for its completion regardless of the amount of time taken for vitrification, for, when a thin layer of clay vitrifies on the surface of a body, no air can penetrate to the imprisoned carbon. As the temperature increases, the carbon burns inside of the clay body, and as it must have oxygen to complete the combustion, carbon monoxide gas is generated, the oxygen being taken from surrounding particles containing oxygen. This gas being imprisoned in the intensely hot clay ware, which has almost reached a molten stage, will cause it to swell or bloat, and then we have the spongy interior and distorted shapes. The vitrification period covers two important steps as follows: making the required temperature within reasonable time, and a uniform distribution of heat over the entire kiln. The average time for vitrification is about 36 hours, starting at about 1,400 degrees Fahrenheit and going up to about 2,100 degrees Fahrenheit. This time will vary considerably, due to different kinds of coal, amount of draft, size and number of fireboxes and to the nature of the clay. The writer has found that attempts to increase the temperature too rapidly at this period require an excessive amount of cleaning of fires and this is likely to result in fire-cracking and crazing, especially during the early stages of vitrification. In the latter stages too rapid heat-increase will not permit uniform distribution thruout the ware in the kiln. In raising of the heat too fast, the necessary amount of air is not admitted for proper vitrification. Close firing results in reducing conditions, the heat remaining in the top part and burning the top pipe and outside ring of pipe too hard; and it causes the filling or stuffing, that is, small pipe inside of larger pipe to burn too soft. When glazing the ware in this condition, the top pipe may be very nice, while the pipe one or two high from bottom and the stuffing are unglazed.

By taking a reasonable amount of time in making the heat, allowing air to pass in over the fires and gradually reducing the draft, the heat will be conveyed from the fire-boxes and top of kilns to the middle, sides and bottom. By regulating the draft and leaving fires open, a soaking process is obtained, which is the holding of the temperature about uniform and distributing the heat uniformly thruout. The soaking process should begin as soon as the temperature and vitrification of the top pipes is sufficient for glazing; and then by the manipulation of drafts and fires, the temperature is held constant. No large amount of heat dare be lost during the soaking period, for if the heat is lost, it is very difficult to regain it. When the soaking process is on, the draft is reduced to check the inrush of cold air, and by giving close attention to fires while the air is going in over them, the temperature can be held constant, and the heat conveyed from the fires to the bottom ware. By repeating the firing and checking of the draft, the heat can be brought to the bottom or floor of any kiln.

There are three common means of determining the temperature or degree of vitrification necessary for proper glazing: trials, cones, and pyrometer. The trials made from the clay can be used alone. The cones may be used alone, altho they are sometimes greatly affected by the gases in the kiln, causing variation in their melting points. The pyrometer is very convenient and of great help in raising the temperature, but when the finishing time nears, and the time elements must be considered, the pyrometer only can give us the maximum temperature. The trials, cones and pyrometer used together serve as a check on each other; and too much care can not be taken, for the temperature or degree of vitrification must be right to obtain proper results. The cones and trials should be placed in the same place every time, near the door, so that trials can be easily removed.

It is good practice to use two sets of trials and cones, one set about two feet from floor and the other about four feet from floor and both about five feet from door. With two sets, the distribution of heat can be checked with a greater degree of accuracy. The common practice is to raise the heat to that stage at which, when the trials are drawn and broken while hot, they show a glassy fracture. The clay is then very near the danger line and in a majority of cases has reached proper vitrification for glazing. The writer does not want to mislead anyone by this statement. However, in the clays which he has handled, this is a very good degree of vitrification for glazing, and with slight variation ought to prove correct for most clays from which sewer pipe are manufactured.

GLAZING

The glazing of sewer pipe is not a difficult proposition, if the ware and kiln are in proper shape for glazing. It is only necessary to observe the different colors and sometimes the roughness of ware that are found at one plant, to realize the different conditions of the kiln, gases and ware that must exist to produce these varied results. Starting with the ware at the proper degree of vitrification, clean fires and good draft, the salt is thrown upon the hottest part of the fire, so that it will volatilize rapidly.

The controlling of fire and draft are the vital points in securing a good glaze and smooth ware. Great care must be taken to produce "just right" conditions, as the "extremes" are dangerous. With too much draft, giving oxidizing conditions, the glaze will be very light, and it is generally difficult to maintain sufficient heat to burn the salt properly. On the other hand, not enough draft produces reduction, and if the clay contains particles of iron, with reduction these will fuse, causing very rough ware.

The medium of the two is what produces the fine glazed ware, and the other two, the off colors, light glazes, etc. The amount of salt and number of rounds will vary, altho it seems that five or six applications ought to be enough for any clay.

If it is not I would say that the proper degree of vitrification was not obtained, tho, of course, there are many reasons to cause the amount to vary considerably. The volatilizing of the salt requires a large amount of heat and it is very seldom that the temperature increases during the salting, so that the proper vitrification ought to be obtained before starting the glazing.

If the temperature shows any marked increase, the firing can be let up a little to check increase of temperature. The writer has seen kilns which have been salted from four to twenty times; and in all cases, where the heat was good and proper degree of vitrification had been obtained, the sewer-pipe kilns that were salted four times, were as good as the ones which had received the salt twenty times.

BRINGING *the* STORY "HOME"

LEADING THINKERS in the clayworking industry have, time and again, expressed regret that the articles appearing in this magazine, suggesting new and extended uses for burned clay products, were seen by so small a proportion of the general public, and that, for the most part, they told the story of brick only to men who were already convinced that brick and other forms of burned clay were the best of all building materials.

Brick—letting that word typify many other clay products —needs a press-agent. The number of magazines that are published in this country runs into thousands. A great proportion of these are published to reach certain interests. There is, for instance, one on hospital management, many on real estate and building, a score or more on hotels.

All of these magazines are ready to receive good articles that will interest their readers. They will not refuse to publish these, either, if the writers show that they are interested in some one material.

As an example of what can be done, the article which follows is reprinted from "The Hotel World," a magazine that is widely read among those who own, operate and *build* hotels. It was written by one of "Brick and Clay Record's" editorial staff, and *by request of the editor of "The Hotel World."*

From "The Hotel World's" Annual Building Issue

Eminent authorities in the architectural world tell us that where the ornamentation of a building is not a part of its structural make-up, it is poor designing. Thus, while columns and pilasters may be fluted, and their capitals made ornate with intricate foliage, it is bad practice to inject these flutings and foliage into bare walls or "planes."

A writer in "Arts and Decorations" recently said: "It is a fundamental of architecture that the structure of a building is its most important consideration—that the structure involves architectural *thought*—whereas the decoration, or detailed embellishment involves, rather, architectural *opinion*, or taste, or knowledge—*or the lack of these qualities.*"

The architectural thought is all too often lost in the decorative—or, to be more exact—the decorator's opinion, or taste, or knowledge—or, as has been said, in the lack of these qualities. And in no field of structural endeavor is this more strongly marked than in the building of hotels.

The thought which dominates the design of the exterior is, as a rule, expressed in the finished structure—that is, so far as the exterior is concerned. The solidity of the building, its safety from fire, its great light-wells, its balconies and wide entrances, all crystallize, in brick and stone and terra-cotta, the builder's thought as seen through the eyes of his chosen architect.

At no point—if the architecture be worthy—is the structural thought concealed. From the great granite blocks that form the base of the building, to the toolings and traceries of the cornice, the thought is wrought in harmony—a mind picture made stationary and permanent by the craftsmanship of an army of workmen.

Enter the broad portals of the main entrance, however, and witness the deadly work of the decorator. The column that supports a staircase and which should denote a strength sufficient to bear the weight of those who pass up and down, is shrouded in velvet and bordered with gilt. Evidently the decorator thinks that strength is something to be spoken of in whispers—he sees nothing in the athlete but the muscles of the sewer-digger.

Once in a blue moon, the architectural *thought* is given precedence over the decorative *opinion*, and with what result? In the Hotel Hampton, at Albany, N. Y., there is (or was, before the addition was built) a rathskeller. The building had been a bank before it was made into a hotel. The underground rooms were the bank's vaults. Great pillars supported what had been the banking room. These pillars, in the process which turned this room from a vault into a place of light and life and music and conviviality, were faced with deep purple waterstruck brick from New England. Their massiveness was accented, rather than concealed. In the spaces between the pilasters, panels of varying sizes, depicting scenes in New York state history, were done in Doylestown tile. The room —or series of rooms, for the pillars gave it that effect—was without a flaw.

The famous tap-room of the Hotel Belvidere, in Baltimore, Md., is a wonderful example of pattern brickwork. Here the unities are preserved in that the decoration of the walls is a part of the structural material in brick. It is built into the room, is a part of the walls that form the room. It is brilliant in color, imperishable, high in its ideals of craftsmanship, and, through its very excellence, has brought many visitors to the hotel.

The Norse room, in the Fort Pitt Hotel at Pittsburgh, is a splendid example of Rookwood tiling and ornamental pottery. The New Hotel Morrison, in Chicago, has another instance of the adaptability of burned clay to interior decoration.

Instances of the successful use of burned clay as installed in modern hotels, in pattern brickwork, in tile and in combinations of both, are too numerous to mention. In nearly every case, the designing has been done by the architect, and has had the benefit of carrying his *thought* to the interior of the building.

Here, where guests linger, the atmosphere is dominated by the craftsmanship that almost invariably accompanies the use of burned clay in decoration. Here the mind is allured by the deftness with which a sturdy material is given life and form and pattern and color, where giant fabrics are woven by cunning hands—the warp being, perhaps, brick, and the woof a colored mortar.

The thin veneer of woodwork, the palpably ephemeral fresco, the paint and canvas panel framed in much bescrolled plaster, all bespeak the "here-today-and-gone-tomorrow" spirit of the mural decorator.

The built-in brickwork, either with its own pattern, or bonding tile to the very walls that make and support the building, all of colors fixed by intense heats, and as unchanging as time itself, tells a different story—it is the "last word" and speaks with finality.

Read the Classified Ads.

They contain opportunities, the knowledge of which will well repay the time you spend in reading them.

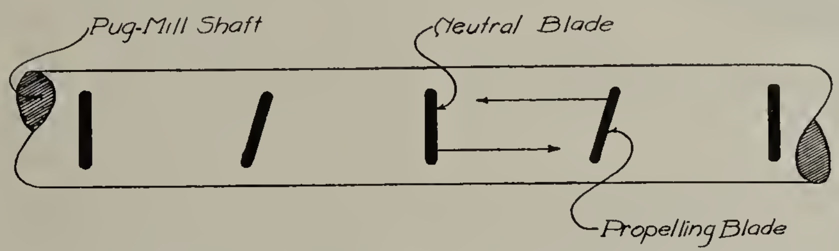
The SUPERINTENDENT

Helpful Hints for Practical Men Whose Problem is Maximum Production With Minimum Cost

Getting Wet Pan Efficiency with a Pugmill

While pugging or tempering is an exceedingly important operation in the manufacture of clay products, there are but two machines designed for this work—the pugmill and the wet-pan. The efficiency of the two machines, judging from their ability to make clay plastic and strong, is widely separated, the wet-pan giving the best results by a large margin.

However, due to the limited capacity and comparatively high cost of a wet-pan, its use is restricted to plants where a thoroly pugged material is essential. Among the manufacturers of the cruder forms of clay products, those who make sewer-pipe seem to be the only ones using the wet-pan exclusively. Many clay plant owners have desired a machine that combines the excellent pugging ability of the wet-pan with the speed and economy of the pugmill, and while no such device has as yet made its appearance, there are ways to improve upon the equipment at hand in order to bring it to a higher standard of efficiency.



View of Pugmill Shaft Showing One Set of Blades. Note Position of Propelling and Neutral Arms

One means of making the pugmill more nearly an ideal pugging device, which has been found to be successful on several large plants, is to place neutral arms between the spiral or pitched arms on the shaft as shown in the accompanying illustration. This provides a force which is opposed to that created by the action of the pitched or propelling arms, giving a pressure that greatly increases the quality of the temper.

The ability of the wet-pan to temper as well as it does, is due to the tremendous pressure that the mullers exert upon the clay, forcing the water well into the pores.

The filling of a dry sponge with water affords a good illustration of how the wet-pan works. If the sponge is allowed to lie in a vessel of water without being manipulated, it will take a long time for it to become saturated. But one or two squeezes with the hand produce immediate saturation.

In the wet-pan, the mullers serve as the agent that squeezes the water into the pores of the clay, insuring a perfect temper. In the pugmill, without alterations, this action is entirely lost. The clay is forced thru the mill by the knives without meeting at any point a pressure similiar to that found in the wet-pan.

The insertion of neutral arms placed at right angles to the shaft, will provide a means of supplying the squeezing force. The propelling blades will then force the clay against the neutral blades and exert a pressure very similar to, altho considerably less than that in the wet-pan.

This change has been known to materially lower the percentage of broken paving-brick in the rattler when it was tried at one plant. At another, it was found that insufficient pugging caused many cracked brick in the drier and many broken brick in the kilns. However, by changing the knives on the pugmill, as above suggested, the quality of the temper was so increased that a great reduction in the number of "seconds" and broken brick was realized.

While decreased capacity may follow such a change, this is well justified in the higher percentage of first-class ware obtained.

Determining the Rise in Kiln Crown

The height of the crown on a round down-draft kiln depends largely upon the class of ware to be burned. This is true because the height of the crown greatly affects the color of the product and, for this reason, a kiln burning face-brick, for instance, would necessarily have to be of a different height than a kiln designed to burn paving-brick.

The rule that works most satisfactorily and which has been adopted as the best method to follow, is to allow for a rise in the crown of one-fourth the width, when face-brick are to be burned, or a rise of one-fifth the width of the kiln for the burning of paving-brick.

The difference of rise in the crown also creates a difference in pressure or thrust exerted upon the walls at the heel of the arch. The place where the strain is greatest occurs at the point where a tangent to the crown of the kiln meets the wall. At this point the strongest reinforcement should be placed.

Using a "Drum" to Handle Large Drain Tile

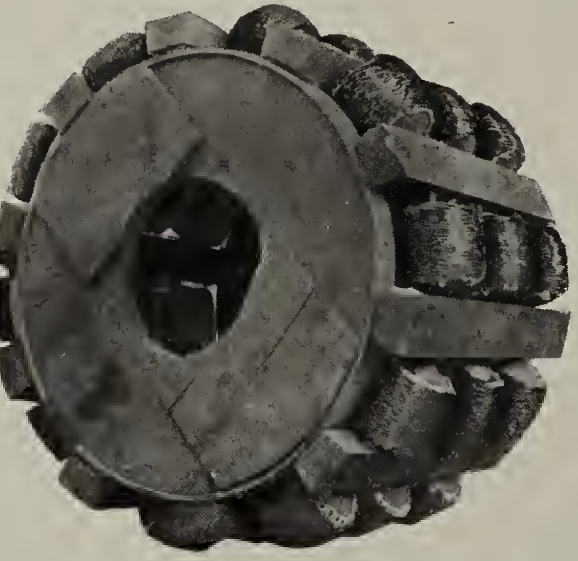
In making large-sized drain-tile with a horizontal delivery machine, considerable difficulty is met in getting the piece away from the machine and onto the drier car in good condition, without breaking or cracking. The farther the tile gets away from the mouth of the die, the greater is the tendency toward "squashing" or a breaking down of the walls, due to the weight of the material. In emerging from the die, while the end of the tile is within a foot of the opening, it receives ample support, but in a double length tile, after it has progressed more than that distance from the die, the support it receives may well be represented by zero. Consequently, unless some other support is given, the tile will "cave in," particularly if it is not made of an unusually strong and tough clay.

A solution to this problem comes from an Illinois drain-tile plant and is in the form of a drum support to be slipped inside the tile before it gets dangerously far from the mouth of the die. This support is left inside the tile until it is placed upright on the drier car, when it is withdrawn to be used on another tile.

The "drum" is of home-made construction, simple and economical. As can be seen in the accompanying illustration, it consists of a number of strips of wood fastened to two circular end pieces. The strips have three holes drilled on both sides into which the metal ends of the cloth covered rollers are inserted. These strips, as has already been mentioned, are nailed upon two circular pieces of wood which act as "heads" to the drum, these being reinforced by cross pieces.

The outside diameter of the "drum" is just large enough to allow its being inserted into the tile. A wrapping of one-quarter of an inch of cloth on the rollers fully protects the tile from being misshapen or damaged by the insertion and withdrawal of the "drum."

Of course, it is necessary to have various sized "drums" for the different sizes of tile manufactured. In addition to this, two or three "drums" of each size should be provided so as to prevent too great an amount of haste on the part of the men at the machine and consequently, a large amount of waste.



Supporting "Drum" Used in Making Large-Size Drain-tile with Horizontal Delivery Machine

The Wastefulness of Wet Clay

Much time and power are often wasted in a plant where no care is taken to get the clay in a reasonably dry state from the pit. In most cases this is chiefly due to lack of foresight, because there is no real difficulty if a plant is laid out properly, except, possibly, where the clay is dug by a steam shovel which is working full time. Even in these cases, much may be done by the exercise of a little care and ingenuity.

When clay is dug by hand, the foreman should see that the digging is worked systematically, and in such a manner as to provide for the draining of the parts of the pit to be dug. In some yards, no care is taken in this respect, with the result that either the work must be stopped because the pit is flooded or the clay is got out in so wet a state that it will not pass thru the machines properly.

It is undoubtedly true that some clay pits have been handled so badly in past year that it is now almost impossible to get them into a satisfactory condition, but even in these, much may be done to avoid future trouble by exercising a little care in planning each man's place and work. If much of the pit is likely to be flooded, and it is impossible to drain it except at a prohibitive cost, the only remedy lies in getting out a sufficient quantity of clay during the summer and autumn to tide over the wet days later in the year. It may seem an unnecessary expense to get out the clay, store it and then have to handle it again, but the cost is not so great as appears at first sight. In the first place, there must be set against it the unknown yet clearly heavy expense of running the plant on part time, the extra cost of getting the wet clay thru the machines, the low output and the additional cost of drying the wet clay after it has been made into brick. When these are all taken into account, it will be found that they amount to much more than the cost of "picking up the clay" a second time, especially if it is stored in such a position that it merely requires to be raked down to the machines.

It is very important to cut adequate drainage ditches behind where the men are working so as to prevent surface water from running over the ground and face of the pit. Similar trenches (which need not be deep if they are sufficiently numerous) should also be dug at the bottom of the pit, and the bottom itself should be kept at a slight slope so as to be automatically drained as far as possible. In working a pit likely to be flooded, it is desirable to go to a much greater depth than is necessary for the clay, so as to form a sort of a catch-basin or sump at one end, into which all the water may be drained. A pump may be placed at the sump, so as to pump out the water.

If the pit is arranged for the clay to be gathered from an almost vertical face, which is gradually receding from the plant, the floor of the pit may be made to slope towards the plant and away from the face of the bank, and drained into a deep trench which is made parallel to the face. If these trenches are dug during suitable weather, the clay from them may be used in the machines, so that the cost of digging is very small and, by distributing the drains wisely, it is easy to keep the pit dry in all but the wettest seasons of the year. During the latter, the clay used in the machines should be drawn from the store accumulated during the drier season; the manager deciding whether he will use nothing but stored clay, or whether he will add some stored clay to that which comes direct from the pit. It depends on the nature of the clay and the kind of treatment which it has to undergo, whether a mixture of wet and dry clay is practicable.—*The Brick and Pottery Trades Journal.*

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The Skintling Method of Setting Brick

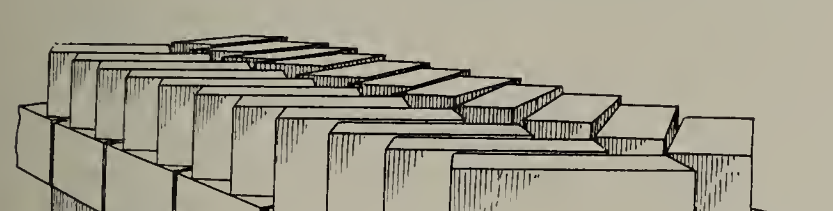
743. *Vermont—Will you please describe the skintling brick-setting system? We are manufacturing common soft-mud building brick and use the scove type of kiln.*

"Skintling" is an English word and describes the manner of setting brick diagonally to facilitate drying. From this application, it seems, that the practice has spread to the use in kiln setting, but it is not a very familiar method in this country.

Attention is called to an article by A. F. Greaves-Walker, appearing on page 502 of the Oct. 5, 1915, issue of "Brick and Clay Record" under the heading "Setting Down-Draft Kilns," which mentions this style of setting, further stating that it is commonly used as a tie-in course in kilns that are so located that the top portion must be wheeled out first, leaving the "bottom" until the last. This "bottom" may consist of a varying number of courses. In order that these "bottom" courses may be wheeled over without danger rolling under the running planks, it is necessary that the courses of brick be set in such a manner as to make a firm false floor or wheeling course, commonly known as the "herring-bone skintle."

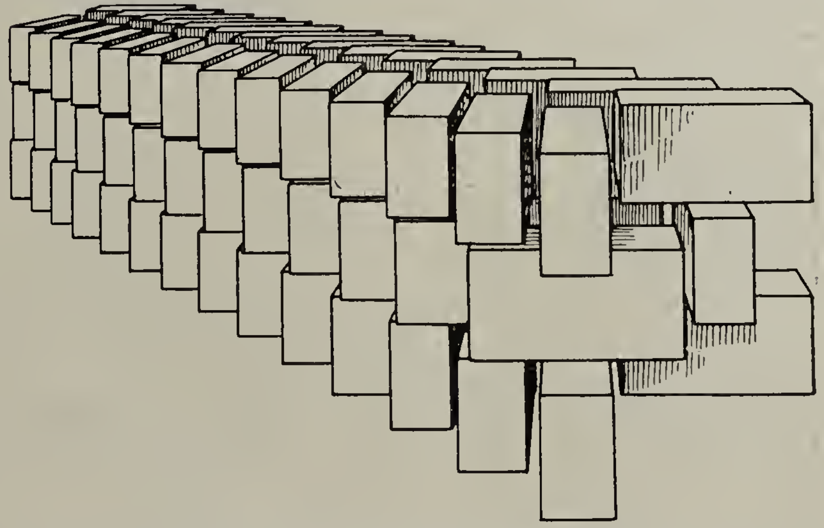
However, we presume that you are making what is known as New England "Harvards" and, this being the case, that you are anxious to get a maximum number of diagonally flashed brick such as are manufactured in some parts of Pennsylvania and which are sold as "Dutch" or "Skintle" brick.

Acting upon this assumption, the accompanying sketches are offered as illustrating the skintling method of setting brick. The first of these shows a method that is followed on a Pennsylvania face-brick plant and consists of alternate courses of straight and diagonally set brick. This method produces a very beautiful diagonal flash.



A Skintling Method of Setting Which Employs Alternate Courses of Straight and Diagonally Set Brick

The other illustration shows a method that is followed by one of the large New England brick companies. Every course is skintled, every other course being set diagonally in the same direction. This system of setting is applicable to the scove kiln; in fact, most plants using this method also use scove or clamp kilns. The skintling method of setting brick affords a speedy and easy way of placing brick in the kiln, incidentally producing a wide variety of flashings.



A Method Followed in New England Where Every Course is Skintled, Every Other Course Being Set Diagonally in the Same Direction

Applying a Time Schedule to Burning

764. *New York—I have been very much interested in articles that have appeared in "Brick and Clay Record," especially that on "Controlling Temperatures in Down Draft Kilns," by C. O. Arbogust in the October* 19 *and November* 2 *issues. I concur fully in the method and manner of burning as described therein. In all articles, however, covering the subject of burning in round down-draft kilns, I have never seen stated the approximate time given to watersmoking, oxidation and finishing.*

We use in our plant principally twenty-eight-foot round, down-draft, center stack kilns. We manufacture hollow-tile and hollow-brick. We burn the hollow-tile in from four to four-and-one-half days of twenty-four hours each. In burning hollow-brick we find that it takes approximately five days. With the entire burning time, as given above, can you tell us how long it should take to watersmoke, oxidize and finish, considering each as a separate operation? Our clay seems to stand fast work in the watersmoking with the heat in the kiln (on top) at around 800 *degrees Fahr. toward the end of the watersmoking period. Is that temperature correct in order to get the best results at the finish of the burn? Regarding this point, we seem to get the best results at that period with a reducing atmosphere in the kiln.*

I would also like to know what number of fire-boxes is considered best to have on a twenty-eight-foot kiln and the dimensions of same. Also in using open, slanting grates, what should be the angle of incline or slope and the best size

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(length, width and thickness) of grate bars to use. Should the grates extend from the very front of the fire-box, or begin at a point ten or twelve inches from the front, this space being open and not covered. What is the best construction of fire-box and grate-bars for fuel economy, also is an open or covered fire-box best?

The time consumed for watersmoking, oxidation and finishing cannot be specified for various reasons. The time factor is dependent upon the clay being burned, its degree of density, amount of impurities, method of setting, the kind of kilns, and so on down a long list of conditions. For this reason, it would hardly be possible for us to specify just how much time should be spent upon the three divisions of the burn above mentioned. It is a question that would have to be determined by experiment with your kilns.

We suggest that you would get better ware in the bottom of your kilns at the finish if you did not reach such a high heat (800 degrees Fahr.) in the top at the finish of the watersmoke. The reason for this is simply that the top ware is so far in advance of the bottom, that it matures considerably in advance of the bottom courses. After the top ware matures, it has a tendency to overburn during the period that the bottom is being finished. Or it may be necessary to close the kiln to prevent overburning, before the bottom is completely burned.

The fact that you secure better results with a reducing condition at the finish is explained, perhaps, by the fact that at this point you follow what is considered good burning procedure—that of bottling up the heat in the kiln with a lowered damper, checking the draft. This produces a strong tendency towards the creation of reducing gases.

It is good practice to use not less than eight fire-boxes on a kiln twenty-eight feet in diameter, and nine if the kiln should by chance contain only one door. The size of your fire-boxes can be obtained by referring to an article on the "Design and Construction of Down Draft Kilns," by A. F. Greaves-Walker, published in this magazine beginning in the September 7 issue and concluding in the September 21, 1915, issue. On page 430 of the last mentioned issue is given some very good thoughts on the design of the fire-box in a down-draft kiln.

The angle of incline for slanting grates cannot be determined without a visit to your plant. It depends too much on local conditions, your method of firing and the kind of coal used, grading from slack thru mine run to lump. Ordinarily a pitch of about fifty degrees is very serviceable.

By all means let the grates commence at a point ten inches from the outer line of the kiln, or if you do not care to do this, arch over the top of the box with firebrick to prevent the escape of heat into the open air. One of these two requirements is imperative for good burning and fuel economy.

Wet Clay Sticks in Elevator Buckets

753. *Indiana—We have recently had considerable trouble with the perpendicular elevator which we have in use at our plant for elevating wet clay to the steam press, on account of it sticking to the elevator buckets. We have been using oil on these buckets which, of course, relieves the situation considerably and works exceptionally well, but we know that we are going to get into trouble by the oil ruining the belt in a very short time. We would be glad to have you, or any of your readers, advise us what their experience has been in over-*

coming this difficulty—one with which nearly every clay plant has to contend at one time or another. If using oil is a good way to overcome the trouble with the wet clay, what kind of a belt could we use that would not be injured by the application of oil to the buckets?

Answering the last part of your question first, regarding the kind of a belt to be used, we should say that chains running over sprockets at the top and bottom of the elevator would eliminate the danger of oil damaging a rubber or canvas belt.

Or another method that is followed at many plants for elevating wet, sticky clay, is to discard the buckets and substitute flat plates, these being bent at right angles to permit their being bolted to the belt. This method is suggested for the reason that wet clay gets jammed into the ordinary cup bucket and clings there tenaciously. The flat plate has a tendency only to carry the clay.

However, if this method does not seem feasible, the type of bucket which you are now using might be changed, or to go back to our original suggestion, substitute chains for the belt, using the same type of bucket as at present but keeping them well oiled.

As is suggested by our correspondent, we should be glad to have our readers give him the benefit of any experience they may have had along this line.

Has Trouble with Smoke from Fire-Boxes

763. *Ohio—We have round down-draft kilns located inside our plant building and are annoyed very much by smoke coming from the furnaces. Can you, or any of your readers, give us the design of a furnace that will be so constructed as to avoid this nuisance? It seems as tho we ought to be able to install a furnace so that smoke from the kiln fire-boxes would not trouble us any more, for instance, than from a boiler furnace.*

We presume that you are using slanting grate furnaces and that, when the draft is stopped down during a period or periods of the burn, that the smoke backs out from the fire-box into the building. If this is the case, then a box furnace, several types of which are advertised in this magazine, would solve your problem effectively. This, it seems, should entirely eliminate any trouble you are now having with smoke.

If, however, you are already getting the "back lash" with a box furnace which is equipped with doors, it would seem that your trouble is entirely one of weak and insufficient draft. The reason for this might be due to the stack being built too small; under-flue and floor work poorly designed or dirty; setting is too tight, or some similar cause, tending toward draft retardation.

With your kilns located inside the building, protected from varying winds, it should be a comparatively easy matter to so regulate your draft that there is always an easy flow of gases into the kiln, and rarely out.

Will Weathering Clay Minimize Scumming?

757. *Alabama—We have a marl with which we are experimenting. It makes a splendid brick but "whitewashes" badly. This is caused by sulphur in the marl. We use a scove kiln and the odor of sulphur is very strong while burning. I have noticed a great many complaints in your paper about "whitewashing" and believe that some of these plants could do away with this trouble by using wood to dry off with instead of coal. We have used coal for watersmoking for some time in the past and have had this trouble with our clay, however, since we began using wood, this difficulty was eliminated until we began experimenting with marl. What I want*

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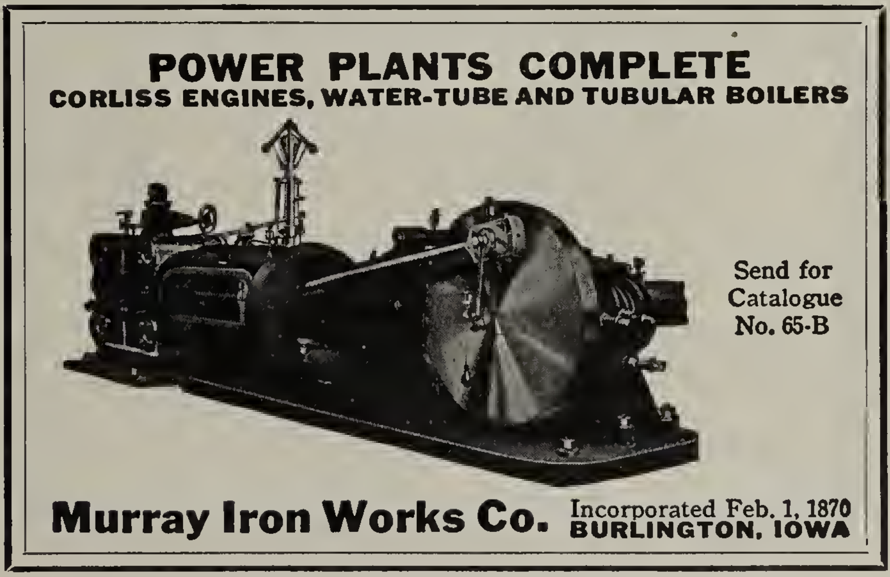
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to know is, if exposure to the air for a length of time would help the clay. I have failed to state that there is some lime in this marl, but not in sufficient quantities to cause much trouble.

The soluble salts causing "whitewash," that seems to be your great difficulty, may be present as soluble salts in the marl before the green brick enter the kiln, or they may be formed in the kiln due to the presence of sulphur gas in the fuel.

However, since you state that you are using wood instead of coal for this period of the burn, the latter condition is not probable.

The removal of soluble salts causing "whitewash" by weathering the clay has been done on several occasions. The process is a leaching out of the salts by the rain water which percolates thru the pile of clay after each rain. As one can readily realize, this process will take a rather long period of time, even for small amounts of these soluble salts. It may take from six months to a year.

If this method were tried, the leaching process would proceed more rapidly if the clay was spread in a thin layer. A bed of three to four feet in thickness, for instance, would be better than a high pile.

Grates in Up-Draft Kilns

A question was published in the March 7 issue, under the above title, and as "752—Montana." Since that time, the reader who sent in the question has written us as follows:

Will you please state what you mean in your first paragraph by the expression "three lengths of grates"? Do you mean that the whole grate should be three times as long, or do you mean that we should use three pieces of grating, each forty-two inches long? We watersmoke all of our kilns with wood and do not use coal until after the watersmoke is all off.

We assume that the questioner is using the ordinary "Ground Hog" up-draft kiln. In this kiln the fire is thrown all the way thru the kiln—the entire furnace opening into the arch formed by the setting. In such a kiln it is usual to have the grates extend beyond the furnace proper, into the kiln. If we assume the grate to be thirty-six inches long in the ordinary construction of a kiln of this sort, one grate would be in the furnace proper (which is under the main wall of the kiln) and two lengths of grates would come inside of the kiln in the arch, making the total grate surface, say, nine feet in length, six feet of which is inside the kiln. This is not absolutely necessary, as brick have been burned with success without the grates inside the kiln. It is much easier, however, to obtain a good burn with the aid of the longer grates.

Brick Oil Tank Stands Severe Test

Following a tremendous explosion, and after three thousand five hundred gallons of oil had burned for ten hours at a terrific heat, a brick fuel oil storage tank at the Wilson Brick Company's plant, Wilson, Conn., passed thru an unusually severe test with but little damage—in fact it required an expenditure of but $75 to make the tank as good as new.

It will be remembered that on page 449 of the September 21, 1915, issue of this magazine, mention was made of an accident at the above company's plant on the evening of

September 9, entailing a loss of about $3,000. Since that time, the owner of this plant has written us, stating that our account of the accident was only partially correct and furnishing further details, which, to say the least, are very interesting.

At this plant there is a brick oil storage tank which is buried in the ground and covered, with the exception of the very top of an arch which forms the roof of the tank. The receptacle is thirty-six feet long, nine feet wide and nine feet high on the inside from the floor of the tank to the top of the roof. The walls of the tank extend up straight to a distance of four and one-half feet from the foundation. These walls support an arch one foot in thickness which is thrown over the top of the tank to form the roof. The bottom of the tank is of brick, two feet thick, and grouted with cement. The side walls are twenty inches thick.

The explosion raised and then dropped back into the tank just two-thirds of the arched top. This was the only damage suffered during this part of the accident. Following the explosion, the contents of the tank—thirty-five hundred gallons of oil—started to burn, and after raging for ten hours, the only damage done by the flames was the melting of the brick in a few places to a depth of about one-half inch. It is interesting to note that the cement mortar used in laying up the brick was practically destroyed on the inside course.

After relaying the last mentioned portion of the tank on the side walls, replacing the arch which had fallen and cementing the inside of the tank, the owner states that the receptacle was made as good as when first built, at an expense of only seventy-five dollars. He further states, "Had this been a metal tank, it would probably have been a total loss. There is no material known, other than brick, that would have withstood this terrific heat for such a long period of time, to say nothing of the pressure from the explosion."

Research Fellowships at Illinois University

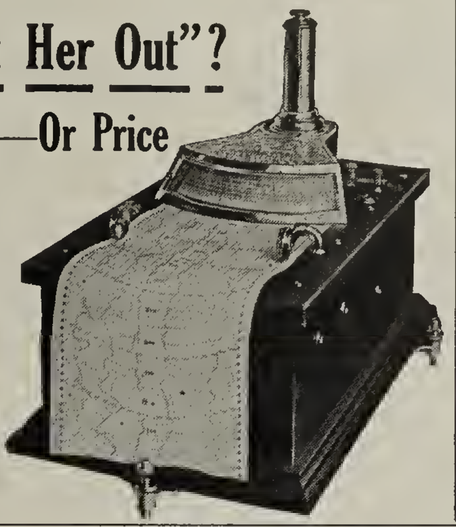
To extend and strengthen the field of its graduate work in engineering, the University of Illinois has, since 1907, maintained ten Research Fellowships in the Engineering Experiment Station. By action of the Board of Trustees on March 9, 1915, four additional Research Fellowships were created, making fourteen in all.

These fellowships, for each of which there is an annual stipend of $500, are open to graduates of approved American and foreign universities and technical schools. Appointments to these fellowships are made and must be accepted for two consecutive collegiate years, at the expiration of which period, if all requirements have been met, the Master's degree will be granted.

Research work may be undertaken in architecture, architectural engineering, chemistry, civil engineering, electrical engineering, mechanical engineering, mining engineering, municipal and sanitary engineering, physics, railway engineering and in theoretical and applied mechanics.

Pennsylvania Farmers Hear Talk on Brick Roads

At a large meeting of farmers in eastern Pennsylvania held during the recent sessions of the Geigertown Farmers' Union, E. B. Dorset, connected with the state agricultural department, discussed the topic of "Roadmaking," strongly advocating the use of brick as the proper paving material for good roads in the rural districts.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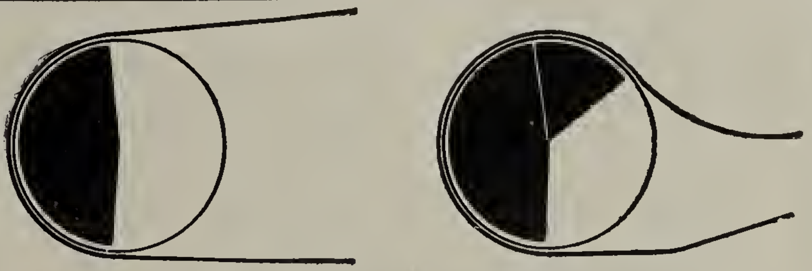
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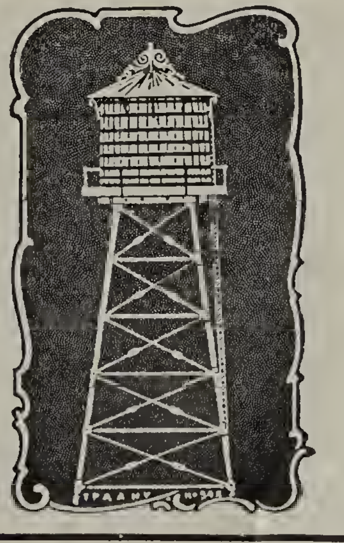
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This coal will save you money, you burn less to get better results more easily. Inquire now from

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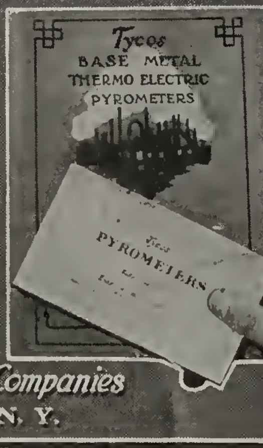

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Taylor-Cambridge Division
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ROCHESTER, N. Y.

The SALES-

Short Stories That May Help the Salesman Who Aspires to Salesmanagership and the Salesmanager Who Wishes to Retain His Ability to Close Big Deals

What Does It Cost You to Sell?

The brick dealer's expenses are practically all selling expenses. That is to say, his business is selling brick, and the cost of maintaining his office, his display room, of putting salesmen on the street, or operating an automobile, of paying car-fare, of advertising—every item, in fact, which appears on his books—is part of the general selling expense.

It is well to know exactly what this is.

Inquiry among successful brick dealers shows that their average cost of selling is ten per cent. This may seem high, but it is based on actual experience. It includes all of the expenses of the business—and all should be included in figuring the selling cost to be charged against every sale which goes on the books.

The man who knows how much it costs him to do business is less likely to cut a price.

If he is paying $15 a thousand for brick, and he can secure a sale at $16, he is not going to flatter himself that he will "make" $1 a thousand on the deal. On the other hand, *he knows* that he is going to lose sixty cents a thousand, for the cost of doing business is figured on the selling price, and not on the price of the brick at the plant.

The dealer who *knows* his cost may occasionally take an order at a close price, but he is less likely to do so than the man who does not realize what it is costing him to do business, and who consequently confuses margin with profit.

Why the Percentage Plan?

The average salesmanager may not realize that the way in which a prospective home builder arranges financial details with the real estate man or contractor—assuming that no architect figures in the deal—is of interest to him. Yet, it is a well-known fact that one of the obstacles that is making it hard to sell a quality product at a quality price is the increasing part that contractor-architects are playing in the situation. The same is true of large speculative builders.

Where the house is built first and then sold, there is no way of side-stepping the fact that the price of the material is going to be the builder's first consideration. He wants quality—if he can get it accompanied by a low price. And that makes the chances of the real salesman getting the order, extremely limited, compared with those of the man whose chief equipment is a sharp pencil.

But there is a chance for good business in this field of small homes, in the numerous cases where the owner arranges with the builder or real estate man for his building, and has a part in determining the design and specifications.

If the contractor-architect or real-estate-building concern takes the job at a lump price, again the question of "hammering down" the cost of material comes to the front, but if, as is getting to be more and more the tendency, the work is taken on a percentage basis, the brickmaker still has a chance to get the business on something like an attractive basis.

In that event the contractor will get his margin of profit regardless of the price of the material that goes into the

MANAGER

If These Stories Help You, Let Some of the "Bigness" That Has Made You a Successful Salesman Cause You to Write Us One Selling Letter

work, and therefore he endeavors to deliver the right combination of quality and reasonable price, without making low cost the first and only consideration.

From that standpoint, it is evident that anything that the brickmaker can do to "boost" the percentage system is good business for, if sentiment becomes strong enough to make that plan universal, it will provide a large opportunity for the right kind of brick to be sold by good salesmanship and at prices in which there is a reasonable margin of profit.

Selling Service

One of the most difficult problems that any salesman has to meet is to make evident the quality that is represented by a high price. When his commodity is in competition with others, and his price is higher than the rest, he has to produce a really convincing line of argument in order to make the sale at the higher price.

In marketing brick, difference in quality is not always evident from a superficial examination, and yet the man who is selling a quality line should be able to demonstrate the value indicated by the higher price without much difficulty.

"Service is my main talking-point," said the salesmanager of a large concern that deals in face-brick, recently, in explaining how he is able to get orders for his line, when buyers can get approximately the same brick for a lower price. "The architect or owner may not be able to see the value represented by the difference in quotations, but either of them will readily appreciate the truth of my statements when I say:

"'When you buy brick from the company I represent, you are assured of service in two directions, first, immediate delivery, and second, material that comes up to the samples—not approximately, but absolutely. If you want to experience satisfaction in carrying out this work, you must have good service, and part of the price quoted represents the high grade of service which we are prepared to give you.'

"This argument appeals most strongly, of course, to those who have had experience with slow and irregular deliveries and brick that were not according to samples."

What "Dumping" Really Means

Anybody can be an order-taker, but it requires a real salesman to produce business at a profit.

This business truism is particularly applicable to the selling of brick, because of the tendency to unload on the market the moment the supply becomes a little unwieldy.

The pressure of the stock on hand is always felt when it is present, and the desire to turn this stock into cash without insisting that the price carry a sufficient margin of profit, is usually very much in evidence.

The concern that "dumps" 150,000 or 200,000 brick in a market, because the stock sheds happen to be overloaded at the moment, may figure that it is playing a "wise game," but the question involved is more than merely the matter of "getting rid" of a surplus stock.

The sale of a large quantity of low-priced brick reduces

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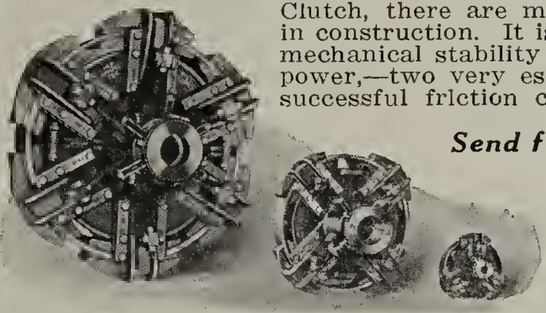

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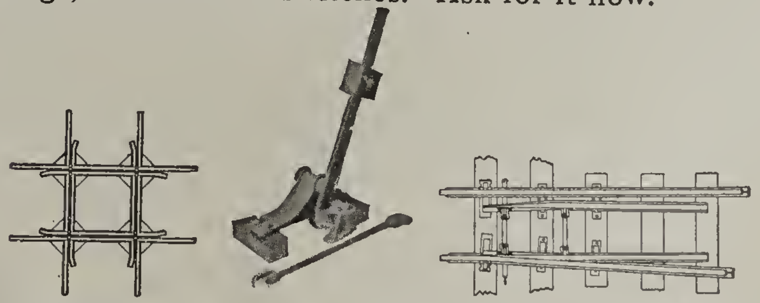

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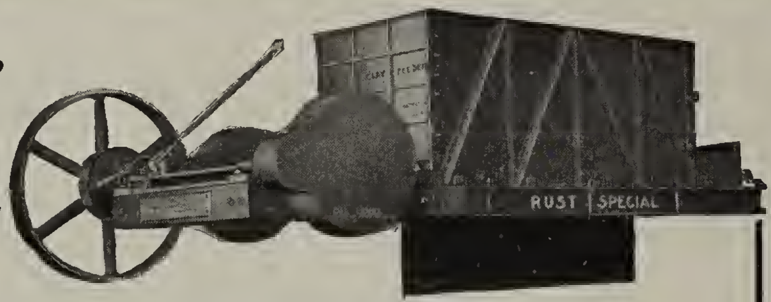

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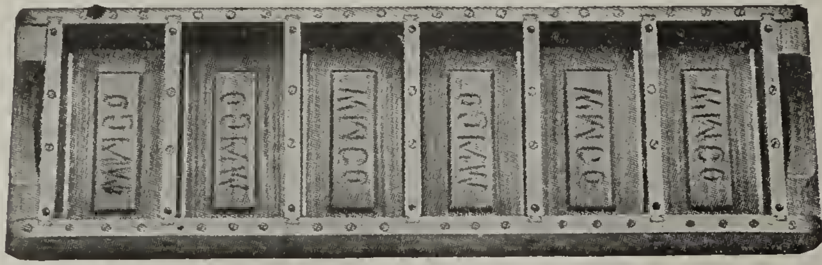
Molds of EVERY DESCRIPTION



BUILT OF AIR DRIED STOCK
I have made a life-time study of the manufacture and sale of brick molds.
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JAS. W. HENSLEY, : Indianapolis, Ind.

the opportunities for sales later. It likewise reduces the opportunities for a future profitable business in that market, because of the bad example set by the low price.

It is easy to cut a price but very difficult to institute an advance.

The brickmaker who sells today at a loss to get his money out of his stock, may imagine that next month he can get business at a price that will carry a profit, but buyers have long memories, and the man who has peddled his brick at a low price will find that everybody who is in the market is willing to consider his ware—but at the lower price!

Co-operation Helps Sell the Product

There is a tendency to regard the sales department as something entirely independent of the manufacturing end of the business. When the divisions of labor, so to speak, are laid down too sharply in a large organization, there is an inclination for these two departments to drift apart. And this is not for the best interests of the business.

As a matter of fact, each department is entirely dependent on the other. Each must "make good"—and keep on "making good"—in order that the other may exist. Unless the salesmanager and his organization get the business, the plant cannot continue to run; and it is equally true that, unless the manufacturing department turns out a product that is "right," the sales force cannot continue to turn in the orders.

One of the features of the sale of face-brick, is that the sample or panel is the basis of the order. The customer usually buys because he has a strong desire for a particular color and texture. It goes without saying, therefore, that if the manufacturing department fails to produce, for delivery, brick that match the sample, the efforts of the salesmanager are sure to be severely handicapped. He is not only going to find it difficult to satisfy the customer, but such a failure will hurt him in connection with future business from the same source.

Of course, as a manufacturing proposition, it is not simple to maintain absolute uniformity in color. The point is that the sorting should be taken care of at the plant, and not on the job. Shipping brick which ranges in color from light to dark, when a medium shade was specified, is not only poor manufacturing, but it is worse salesmanship, and is the best possible way to get the manufacturer "in bad" with the customer.

Madero Brick Held for Advent of Peace

Piles of fire-brick and various shapes, covering perhaps an acre of ground and valued at more than half million dollars in United States money, are being held in bond by the customs' authorities at Eagle Pass, Tex., pending their shipment to Mexico when peace and order has been restored, or some other disposition.

This shipment of brick and fire-clay products came from Antwerp, Belgium, and was consigned to Compania Carboniferro la Rosita Coahuila at Monclove, Mexico. The material was to have been used in the construction of a large number of coke ovens of the company at its mines at Rosita, state of Coahuila. Owing to the fact that members of the Madero family are largely interested in the Compania Carboniferro la Rosita Coahuila, and that revolutionary conditions in Mexico were not deemed favorable to these interests, it was decided to hold up the big shipment when it reached Galveston. After being detained in bond at Galveston for some time, the shipment was moved to El Paso over the lines of the Southern Pacific Railway, requiring about twenty cars to transport the consignment. It is stated that the freight charges amounted to $30,000.

HOW NEW YORK PAVES *with* BRICK

H. E. Breed, First Deputy Commissioner Recites Experiences in Construction Details

As a result of its experience in building about 300 miles of brick pavement prior to January 1, 1916, the New York State Highway Department has selected certain construction features as basic in the success of this type of work. These were discussed at the Pittsburgh convention of the American Road-Builders' Association held recently by H. E. Breed, first deputy commissioner, whose remarks are summarized below. Mr. Breed laid stress on the mixing of grout, the proper selection of sand and favored field instead of plant sampling and testing of brick. He also presented figures on first cost and maintenance.

CONSTRUCTION DETAILS

It has been claimed, Mr. Breed said, that the sand cushion prevents the crushing of the brick and gives an amount of resiliency that is necessary to a pavement of this type. This statement, however, is not borne out in practice, for a five-year-old pavement in which a mortar cushion was used has been bettered by the lack of so-called resiliency.

Many times brick are stored in piles along the road so long in advance of the construction work that they are so spattered with mud from passing traffic and so covered with dust, that it is doubtful whether the grout will properly adhere to them. In all cases of this kind the brick should be thoroly washed so that the grout will cement them together.

Bats less than 3 in. should not be used. If necessary, trim the second brick to accomplish this. The bats should be obtained from brick culled from the pavement, and as every brick is worth from 3 to 4 cents in the pavement, the selection of bats should be made from culls so that the good half can be saved. This is an element of fairness to the manufacturers which all engineers will appreciate.

Great care should be given to the thoro mixing of the grout—sand, cement and water—first dry, then to a plastic consistency, and gradually thinned out until the mixture just reaches the consistency which will flow. In the New York State work the contractor is allowed to use one part of cement and two parts of sand where he employs some form of grout machine. Where he mixes by hand in boxes he is required to furnish grout with one part of cement and one part of sand.

SAND IMPORTANT

Many bad results in brick pavements have been directly attributed to the use of poor sands. The inconsistency of present day practice, according to Mr. Breed, is shown by testing the cement and brick both with a fine degree of engineering precision and trusting the other material, sand, to visual guesswork.

Three different and distinct kinds of sand are used in brick pavements: concrete sand, cushion sand and grout sand. Concrete sand should be clean and have at least 80 per cent of the strength of Ottawa sand in compression. Its gradation should be as follows: 100 per cent passing ¼ in.; 85 per cent passing No. 6 screen; 60 per cent passing No. 20; 25

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The Baldwin Gasoline locomotive is built up to the same standards as are used in constructing the mammoth steam Baldwins.
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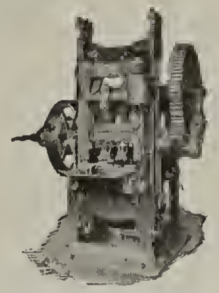

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Cars of all kinds

Every piece of equipment is built of the best material by the best mechanics obtainable. The Lakewood Line is Built to Last.
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Formerly the Ohio Ceramic Eng. Co. Cleveland, Ohio

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BRICK BARROW

Correctly designed and perfectly balanced.
Built of No. 1 Air Seasoned Southern White Oak.
Rigidly re-enforced, and built for service.
Large wide tired wheels—steel or cast iron.
Babbitted Malleable Bearings—self oiling and dust proof.
SPECIAL "HYATT" ROLLER BEARINGS IF DESIRED
Just the barrow you are looking for.
What is the nature of your requirements?
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Why Most Brick Streets Use Lehigh Cement

Because it is not only high in strength but dependably uniform.

A perfect vitrified paving block of your manufacture used with a perfect cement filler of Lehigh Cement makes a permanent street for the city and a permanent highway for the country.

These are only a few reasons why more brick streets use Lehigh Cement than all others combined.

You Cannot Afford to Take Any Risk

Lehigh Cement is the perfect cement. Specify it always. It protects you. Set the proportions for the mixture. Adhere to them. Then your job will be uniform throughout.

LEHIGH CEMENT

Cement Grout for Permanence.

per cent passing No. 50; no variation of over 5 per cent from these figures should be allowed. Sand with over 8 per cent of loam should be rejected. These may seem to be rigid specifications, but if a foundation is to serve its purpose, it should be strong enough to sustain the pavement with the minimum amount of cracking.

Cushion sand should be of such a nature that 100 per cent will pass a No. 6 screen, and it should not contain more than 20 per cent of loam.

Grout sand should be clean and of such a nature that it will have 100 per cent passing a No. 6 screen; not more than 85 per cent passing a No. 20; 30 per cent passing a No. 50; 5 per cent passing a No. 100. It should be rejected if it contains more than 5 per cent of loam.

FIELD TESTS FAVORED

It has been suggested at various times, both by manufacturers and by some engineers, that it might be advisable to test brick at the plant. Mr. Breed believes that the present practice of sampling and testing brick in the field insures better results than testing at the plant, for the following reasons:

Brick are not manufactured uniformly in the same sense that cement or asphalts are manufactured as uniform products. Long experience with a given brand is necessary before the brick can be accurately culled by visual inspection. The men best fitted to cull brick by visual inspection are the employees of the brick company. The sampling from the different benches of the kiln to show the variations in burning can be done more accurately by the burner than by an inspector. Variations in temperature in different parts of the kiln give different qualities of brick. These can be assorted and selected best by the men who burn them.

During 1915 the New York Highway Department tested 269 lots of brick, comprising 22 different brands and representing a total of 27,000,000 brick. Of these 13.6 per cent failed to meet the specifications and were rejected. This does not include the amount culled by the inspectors and rejected on the work, which, in some cases, is rather large.

COSTS AND MAINTENANCE

Up to Jan. 1, 1916, New York State had completed about 290 miles of brick pavements. These different pavements are of varying age, and Mr. Breed gave some figures regarding their cost. The average cost for brick pavement on a 5-in. concrete foundation is per mile of 16 to 26-ft. highway $25,750. The average cost per square yard of *pavement only* is $2.015. These figures were obtained from an average of 23 highways.

In order to get a comprehensive cost of other types in New York State, the following figures on waterbound macadam, bituminous macadam and cement concrete were presented:

Waterbound macadam:	
Cost per mile of 16-26 ft. highway	$10,250
Cost per sq. yd. of pavement only	0.648

The cost per square yard was obtained from 434 values and the cost per mile from 419 values.

Bituminous macadam:	
Cost per mile of 16-26 ft. highway	$12,970
Cost per sq. yd. of pavement only	0.871

Both of these items were obtained from the average of 134 highways.

Cement concrete, 6 in. thick:	
Cost per mile of 16-26 ft. highway	$15,320
Cost per sq. yd. of pavement only	1.121

Both of these items were obtained from an average of 20 highways.

It will be noted that the difference between the pavement cost and the total cost of the highway lies, in all cases except brick, between $4,000 and $5,000. The reason why the cost of items other than pavement is apparently high on brick roads is that the cost of edging has been excluded from the pavement cost and included in the total cost.

Up to Jan. 1, 1915, there had been built in the state of

New York 5,167.19 miles of all kinds of highways. During 1915 the department built 1,083.35 miles, making a total of 6,250.54 miles of road. At the present time there are 783.05 miles under contract which are not completed.

The maintenance charge for 238 miles of brick for the year 1915 was $41,840, or approximately $176 per mile per year. This amount was increased to a large extent by a number of older pavements which had many replacements. Eliminating these, there were 107.91 miles of brick pavement which cost $14,185 to maintain and repair. This is at the cost of approximately $131 per mile. These figures, as mentioned at first, are not the figures from the pavement alone, but include such treatment as cleaning ditches, cost of patrol where patrol was needed, fixing the shoulders which are cut up by the turning out of traffic, the cleaning of slides and maintaining of guard rail. From observation it would be safe to say that about 30 to 40 per cent of this cost is the average cost that would cover the maintenance of the pavement alone, altho in some cases, for a series of years, there is practically no cost to the pavement proper.

The cost of maintenance of other types of pavement during the same year was computed on the same basis as that for the brick roads, i. e., including the maintenance of guard rail, shoulders, ditches, patrol, etc., as well as the surfacing For gravel it cost $577 per mile for 192 miles of road; for waterbound macadam it cost $564 per mile for 2,298 miles of road; for penetration method bituminous macadam it cost $448 per mile for 2,387 miles of road; for bituminous macadam mixed method it cost $181 per mile for 63 miles of road. For second-class concrete roads requiring surface treatment it cost $532 per mile for 295 miles of road—*Engineering Record.*

The Semi-Monthly Trade Review

THE TREMENDOUS MOMENTUM with which building operations have been moving during the past several months, received a slight application of the "brakes" since last this review made its appearance.

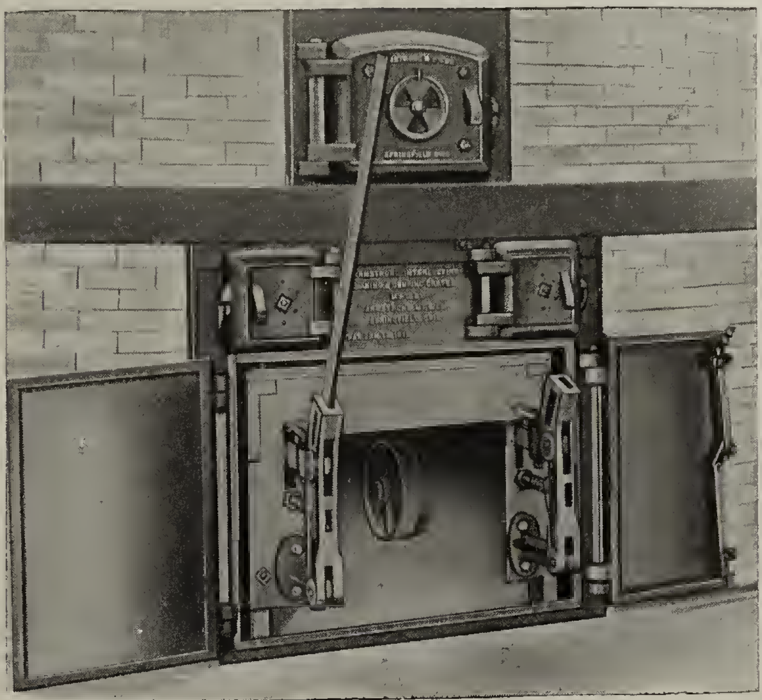
The freight traffic situation and the steadily rising price of materials, have conspired to throw sand in the machinery of building progress, resulting in a reduction of speed.

In spite of the steps that are being taken to better traffic conditions, continued bad weather has been a drawback and apparently the freight congestion is as bad as ever. This has had a "slowing up" effect on building in many localities, due to the difficulty of getting material on the ground promptly.

The sharp increase in the price of building materials is

Slant grates—open boxes
The Old Way
The doors are always open or not in use. The flame flares out of the furnaces, the fire boxes are cleaned by periodical destruction of the fuel bed. Enormous quantities of heat and fuel are wasted.

Shaking grates—closed boxes
The New Way
The doors may be kept closed as they are equipped for proper draft regulation. The fuel bed is always kept clean by the easily worked shaking device. Maximum heat is utilized with the Armstrong Kiln Grate.



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No matter what the nature of your clayworking plant, it is no doubt possible for you to add Flower Pot manufacturing with very little additional outlay.

Often you wish you had some way to keep Jim Smith or Jack Jones busy all the time, don't you? Well, here's the solution: put in a

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Easy to operate, absolutely accurate. Makes any regular size pot desired.

Send us a sample of your clay and let us show you what our machine will do.

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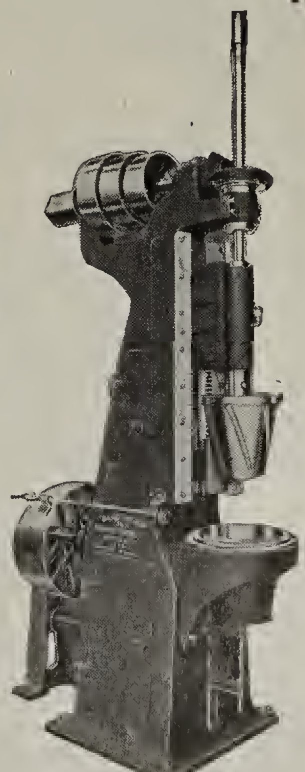

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You select them carefully don't you? Well then pack them safely and attractively and they'll work for you.

H & D Corrugated Fibre Boxes

will deliver brick unbroken and unchipped and save you money, time and trouble besides. They are inexpensive, light, resilient, strong. They come folded flat, are easy to pack and unpack and **they certainly do prevent breakage and chipping.**

Write for sample.

The Hinde & Dauch Paper Co.

Sandusky, Ohio

declared by real estate operators to be responsible for the holding up of a large amount of construction and development work that had been planned for this spring, particularly in the large cities. The situation is considered serious, as millions of dollars' worth of projects are involved. Practically every material used in construction work has been advanced during the past couple of weeks. Builders declare that there is no good reason for such a jump in the cost of material and that the producer and manufacturer is simply taking advantage of various conditions now existing to "boost" prices and increase his profits.

RISING COSTS MEAN HIGHER PRICES

This charge is answered effectively by the manufacturer and building material dealer with a statement showing the scarcity of supplies and the increased cost of labor.

But in spite of these unfavorable conditions, builders at many points are disregarding every impediment and are continuing to file an increasing number of permits for new structures.

In Chicago, for instance, nothing seems to dampen the ardor of the prospective builder. Permits are holding up well and real estate sales are showing a large increase over the same period last year.

Building activities in Cleveland, Ohio, are reported as being far ahead of the corresponding period in 1915. There is every indication that this industry will show a satisfactory record when the present year ends.

Detroit reports that building is continuing on a large scale, many operations of importance being contemplated. The supply of building materials to date in this city is adequate for the demand, altho there is a tendency for prices to advance.

Quite extensive building operations are already under way in Minneapolis, Minn., while St. Louis states that, in financial circles, adjustment to unusual conditions is gradually coming about and there are evidences that capital is turning to real estate and the improvement of residence and income property.

In Baltimore real estate operations have improved from week to week, the erection of large industrial plants, the building of new warehouses, dwellings and so forth, indicating steady expansion commercially and industrially.

GOTHAM TURNS TO SECOND-HAND BRICK

Second-hand brick seems to be the barometer of building conditions in New York City. Prices are higher than they have been at any time since the building boom in 1907, when Hudson river common-brick reached a price of $11.20 a thousand. The present price for second-hand cleaned brick is $5.25 per load of 1,500 at point of demolition. Architects, who never would touch a second-hand brick for a building, are literally grabbing them. Such a high price for this sort of material is comparable only to conditions ruling about nine years ago, when cleaned brick brought $7.00 per thousand.

This condition has been brought about by statements to the effect that there were only 190,000,000 common-brick available at points along the Hudson river. Such a low quantity would normally advance the market value of all brick in New York. A completion of the official inventory has been delayed by reason of a number of manufacturers withholding their yard counts. There is known to be 300,000,000 brick in sheds up the river and estimates of quantities on hand in yards that have made no statements as to their reserves, give a total of more than 900,000,000, including points at or near Mechanicsville. Simultaneously with these reports, statements have been made of possible further advances in prices, owing to the shortage and scarcity of labor.

There is a lack of laborers in both the Hudson and Raritan

districts. In the latter, one large plant is only able to manufacture fifty per cent of capacity, altho it would operate to capacity if it could get the men. This scarcity of labor, however, is not expected to continue.

Harold Hammond, representing the William K. Hammond Brick Company in the New York market, said recently:

LABORERS TIRE OF MUNITION PLANTS

"We are receiving a large number of letters daily from old employes who have gone to munition plants to work. They are all watching with interest the prospects for getting back into the brick yards. These men are accustomed to working in the open air. We expect some shortage of labor, but not to a great extent.

The last of the covered Hudson river brick has been sold for the season. The normal quotation, therefore, is $8.50 per thousand, wholesale. Dealers are pretty well sold out.

In closing, it might be said that it is hardly logical to assume that the existing freight traffic conditions can last for a very much longer period. The Interstate Commerce Commission, together with the carriers, is taking steps which it is hoped will result in some immediate relief. Furthermore, it is the opinion of those who are in a position to know, that the past two weeks would have shown an improvement had it not been for bad weather conditions. Spring is here, and with it has come a more favorable atmosphere for outside work.

Prosperity brings its problems, as well as rewards. New situations are constantly arising which demand quick thought and action on the part of the clay products manufacturer.

Building Shows Real Prosperity and Progress

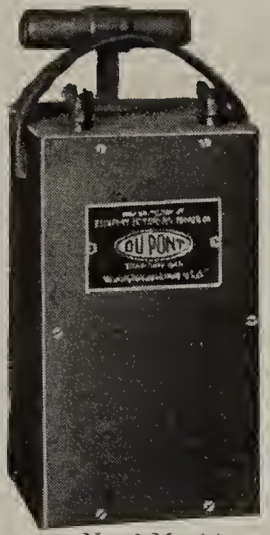
Prosperity, according to the dictionary, is successful progess. Purely material progression exists only during a period of prosperity. Real reforms are born in times of depression, and it is in the process of revolution that true and lasting progress lies.

Progress, in its finest sense, is the striving toward ideal completeness or perfection, while prosperity is only in the nature of thriving—an advance in pursuit of anything desirable. The latter is materialistic, the former idealistic.

The condition of prosperity in this country today is one of true progress, because its basis is fundamentally sound. It had its inception in external affairs, its growth and development in thriving domestic affairs. Bank clearings are breaking all previous records, exports are reaching new high marks as one month follows another, crops were most bountiful, bond sales are the heaviest in years, and the hammer of the builder is ringing more merrily than for some time.

There have been consistent gains in building permits for months. Property owners, who have been waiting thru several long, lean years for the return of normal conditions, are now encouraged to proceed with their building operations. This is true, not only of the individual owner ready to engage in the erection of a country home or city residence, but it applies as well to banks, financial and all other extensive business organizations. Thus the return of prosperity means much in the way of the enchantment of the architectural beauty of our cities thru the erection of these new structures.

There is no good reason why the present period of progress and prosperity should be but a flurry; it should be lasting. And it may be made so thru substituting helpfulness for aggressive opposition, co-operation for competition. In the field of building, particularly, should competition and the evils attendant upon it be eliminated.—*Michigan Manufacturer and Financial Record.*



No. 2 Machine

Make Yours
A "Safety First" Pit
BY USING

DU PONT

Blasting Machines

FIRING loaded bore holes with electrical currents decreases the liability of accidents, increases the efficiency of explosives and reduces the cost of blasting operations.

Simplicity of design, compactness and dependability in operation makes Du Pont Blasting Machines practical and popular with blasting crews.

Safeguard life and property by requiring the use of blasting machines for detonation of explosives.

ASK FOR DESCRIPTIVE FOLDER

E. I. du Pont de Nemours & Co.
POWDER MAKERS SINCE 1802
Wilmington Delaware

***But*—You Can't Do It!**

You can't get the kilns unloaded on time—You can't prevent accumulated demurrage on cars—You can't have satisfied hustling wheelers—

UNLESS

You have a fleet of INVINCIBLES

Look!

IT IS BALANCED

The axle is under the load—NOT at one end of it.

It slides—down the runway—and the hind legs don't rip and tear.

It Rides Its Load

THE TORONTO FOUNDRY AND MACHINE CO.
TORONTO, OHIO

There is a man—

a manufacturer of fireclay products; he has used Canton Kiln Grates for four years.

This man saved 30% of his burning costs each year in the first three years.

Today, in the fourth year, he claims and is accomplishing a saving of—40%.

Are you neglecting an opportunity? In all fairness to yourself, to your trust, to your company—is it right for you to any longer neglect an investigation of Canton Kiln Grates?

We have dozens of sets in kilns. We will furnish you a set on a trial basis.

Write that letter to us—now.

The Canton Grate Co.

1706 Woodland Ave.

CANTON OHIO

THE VERY BEST OF BELTING IS THE KIND THAT YOU FORGET YOU'VE GOT

When your belts run along month after month, transmitting power, conveying material, elevating dust—when you have practically ceased to think or worry about—belting; then you have good belts and the chances are that you are using

HETTRICK RED STITCHED CANVAS BELTING

NO BETTER BELT CAN BE MADE

HETTRICK CANVAS BELTING BEATS THEM ALL

HETTRICK BROS. CO.

TOLEDO, OHIO

IN *the* WAKE *of the* NEWS

Being Brief Mention of a Host of Interesting Happenings in the Varied Fields of Clayworking

PERSONAL

Peter McBean of Gladding, McBean and Company, San Francisco and Lincoln, Cal., who has been living for some time at Burlingame, in the same state, has returned to San Francisco to reside.

J. F. Brown, for many years owner of a pottery at Carthage, Mo., and later connected with a pottery at Coffeyville, Kan., died at his home in the last-mentioned city on March 22.

W. L. Smith, president of the Taylor, Smith and Taylor Company, East Liverpool, Ohio, is at Atlantic City, where he will remain for four weeks. He was accompanied by Mrs. Taylor.

Rodger M. Combs, vice-president of the Thomas Moulding Brick Company, Chicago, Ill., has been appointed chairman of the brick section of the International Association of Rotary Clubs.

A recent visitor to Louisville, Ky., was W. C. Hughes, of Zanesville, Ohio, representing S. A. Weller, proprietor of the Zanesville Pottery Company, manufacturers of art goods, jardinieres, cooking ware and florists' pottery.

James H. Gilhuly of the Western Conduit Company, San Francisco, Cal., has returned from a short trip to Los Angeles, where he was called by a big demand that followed the passing of the new conduit ordinance in that city.

It is practically decided that John S. Haggerty, a Detroit (Mich.) brick manufacturer, will be a Republican delegate from the thirteenth congressional district of the state of Michigan, to the presidential convention to be held in Chicago in June.

William Baines, formerly of Toronto, Can., has been appointed superintendent of the Hamilton (Ill.) Clay Manufacturing Company. His previous experience, gained in managing plants in both the United States and Canada, qualifies him beyond a doubt for his new position.

Benjamin Brooks of the International Clay Products Bureau, Kansas City, Mo., spoke recently to the engineering students at the state university at Iowa City, Iowa, on the use of burned clay products, and addressed a body of engineers at the same point on the subject of clay products as applied to sanitation.

C. W. Boxwell has been appointed secretary and sales manager of the Davenport (Iowa) Brick and Tile Company, to succeed John Berwald, who has resigned his position with that company. The offices have been moved to Harrison street, where a large display of hollow-tile is being carried.

Martin Ittner, eighty years of age, and a pioneer brickmaker of Omaha, Neb., died at the home of his daughter, Tucson, Ariz., on March 5. For many years Mr. Ittner was engaged in the manufacture of brick but retired some time ago when his advanced age would not permit active service.

John A. Mercier, a Detroit (Mich.) brick manufacturer, was presented with a silver loving cup by the Board of Directors of the Detroit Builders' and Traders' Exchange, at its semi-monthly dinner held at the Hotel Tuller on March 21. The cup was presented as a token of appreciation for the good work which Mr. Mercier did during his term as president in 1915.

ALABAMA

The Alabama public service commission recently granted L. L. Stevenson, a brick manufacturer of Lovick, Ala., a thirty-cent rate on coal from Birmingham, in place of the fifty-cent rate previously charged. This action followed a protest based on the fact that coal was shipped over the same route, passing thru Lovick, to a point five miles beyond, for the thirty-cent rate.

ARKANSAS

After a shut-down of two years, the Coffeyville Brick Company's plant at Arkoma, Ark., reopened recently with orders on hand aggregating five million brick to be shipped to various parts of Texas. A large number of orders are expected from Paris, Tex., the city that was recently destroyed by fire. The officers of the company anticipate a continuance of good business and beileve that the plant will continue to operate thruout the summer, with an increased working force.

CALIFORNIA

The Ione (Cal.) Fire Brick Company reports an extraordinary demand for fire-brick just now owing to the general resumption of activity in the lumber industry on the Coast.

The San Francisco (Cal.) Board of Public Works is advertising for bids on brick and terra-cotta for the northeast wing of the new San Francisco Hospital. The contracts are to be awarded in a short time.

The Union Iron Works of San Francisco, Cal., will soon be in the market for a large quantity of floor and wall tile and white enameled brick to be used in the construction of the company's new hospital building.

The Pacific Coast Steel Company of San Francisco, Cal., which recently completed an open hearth furnace at its Seattle plant, will soon be in the market for a large amount of Pacific Coast and eastern fire-brick for additional furnaces. These furnaces are to be erected at its San Francisco plant. Later, still more fire-brick will be required for new furnaces to be built at Portland, Ore.

The plant of the Grant Brick and Tile Company, Santa Barbarba, Cal., which has been idle for some time, will be put in operation shortly, modern machinery and equipment being installed thruout. J. Y. Parker, a prominent brickmaker on the Coast, will assume personal charge, acting in the capacity of general manager. Brick and building-tile will be manufactured.

Plans are now under way for a merging of the Pacific Porcelain Ware Company and the Western States Pottery Company, both of which have large plants at Richmond on the east side of San Francisco Bay, with offices in San Francisco, Cal. Following the consolidation, another large kiln will be erected at the plant of the Western States Pottery Company, practically doubling the capacity of that plant.

COLORADO

The Moffat Railroad has announced its intentions to

You can get a higher price for your brick if you guarantee it will be

Scum-Proof

And you can do this with perfect safety by using

R. H. Precipitated Carbonate of Barytes

It neutralizes the salt in your clay so that it cannot appear on the surface of the brick after it gets wet.

But don't accept a substitute—insist on R. H. —**the dependable brand.**

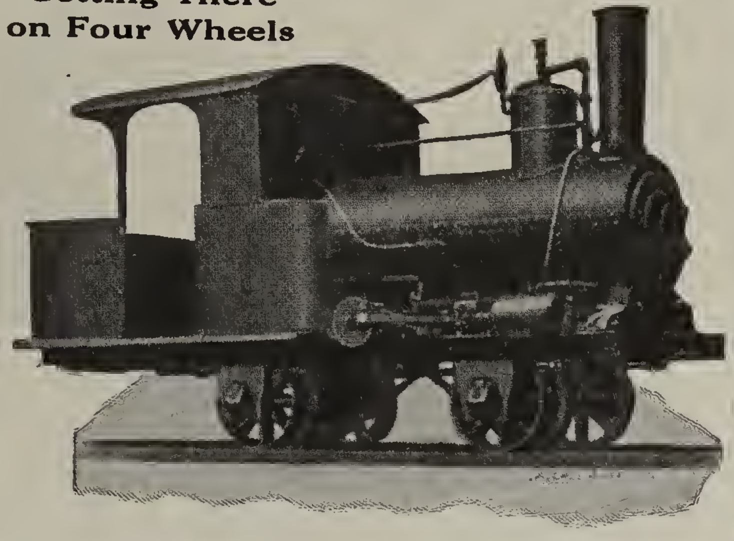
Write for circular and prices.

The Roessler & Hasslacher Chemical Company
100 William St. New York

Chicago, Ill. East Liverpool, O. St. Louis, Mo. Kansas City, Mo. New Orleans, La. Philadelphia, Pa. Boston, Mass.

We carry a complete line of high grade chemicals for the clay industry

"Getting There" on Four Wheels



THE DEWEY 5-Ton Locomotive

Costs $1500 About as Much as a Good Team of Mules

It Never Balks on Heavy Loads or Grades

It pulls a full load under every condition and on any track. Does more and costs less than any type of Standard Locomotive of same size and power.

"Let the Dewey Do Your Work"

Write for descriptive literature and "reasons why" you will save money by having the Dewey in your plant.

DEWEY BROS.
GOLDSBORO, N. C.

Do You Have—

over-burned ware in top of kiln, and under-burned on bottom?

Does your ware crack, soften, and crush in bottom of kiln from water-smoking?

The Improved Hook Patent Up and Down Draft System

entirely overcomes these difficulties, as it is so arranged that the direct heat can be applied to top and bottom at the same time. This causes the ware to be burned with a uniform hardness in all parts of kiln.

The following is a letter in further proof of our claims:

Attercliffe Sta., Ont., Dec. 29, 1915.

Ohio Kiln Co., Vigo, Ohio.

Gentlemen: We are certainly much pleased with the 26-ft. Up and Down Draft Kiln we built last fall from your plans. We burned four kilns of drain tile, the average time being close to 36 hours from start to finish, and we consumed 9 ton of coal on each kiln. What pleased us most was that they were all hard as rocks.

The burning was done by two young fellows who had never fired a kiln of any kind before, but by following your firing instructions they had no difficulty in making a perfect success of each burn.

Yours truly,
Attercliffe Standard Brick & Tile Co.

The evidence is convincing. We are doing it for others, and can do it for you. Let us prove our claims. Mr. C. Hook is associated with Ohio Kiln Co. **only**, and when you do business with us, we assure you that you will receive his personal attention as well as the benefit of his 28 years' experience in designing of kilns, and the actual manufacturing of clay products.

Do not be deceived, insist on having his latest patent kiln.

Sold only by

Ohio Kiln Company, Vigo, Ohio

Tank and Silo Equipment

TILE SILO KALAMAZOO MICH

We buy Glazed Tile Silo Blocks and sell Wood Tanks with steel towers for their elevation. You serve yourself by telling us what you have to sell and we open Opportunity's Door, showing you wherein each may be served in silos or tanks. Both are needed by every *Manufacturer and Stockman* and their installation means profit to live builders and contractors. Open up—tell us your occupation or trade—a clam never gets anywhere! We have propositions that may interest you.

Kalamazoo Tank & Silo Co.

Ft. Worth, Texas Kalamazoo, Mich.

replace the wood structures serving as stations at Craig and Hayden, Colo., with fire-proof brick and hollow-tile buildings.

Work has been started on the new plant of the Jewett Fire Brick Company, to be built at Canon City, Colo. The plant will be equipped thruout with modern machinery.

The property formerly owned by the Buckley Brick and Tile Company, Montrose, Colo., taken over under a mortgage last winter by H. M. Stark, has been purchased by L. R. Allen and will be opened immediately under the name of the Montrose Brick and Tile Company. A 30x90 ft. addition will be built to be used as a tile drying shed. An office also will be built on the property.

DISTRICT OF COLUMBIA

The car shortage situation is becoming serious in Washington, D. C., as well as in other cities thruout the country The Hydraulic-Press Brick Company reports that it is being held up on the shipment of 250 cars from New York because the railroads cannot handle them. This company also reports the sale of red brick to be used in a hospital at Richmond, Va., being erected by the American Locomotive Works and also the grey brick to be used in a new public service building at Baltimore, Md.

IDAHO

The brick plant located at Fourth and Ida streets, Boise Idaho, will shortly be reopened, modern machinery and equipment being installed thruout. The business will be conducted under the firm name of Foster and Son. Frank Foster operated this yard more than twenty years ago but closed it up in 1911.

ILLINOIS

The Frederick (Ill.) Brick and Tile Works opened up recently and is looking forward to a busy season.

The Illinois Brick Company, Chicago, has declared quarterly dividend of one and one-half per cent, to take th place of the semi-annual dividend heretofore paid. Ther was no change in the rate, which is six per cent.

The Manteno Brick Company, one of the Illinois Bric Company's plants, has opened for the year. Despite th fact that this plant has the large capacity of 325,000 bric per day, full time operations are anticipated for some tim to come.

The Illinois Brick Company's plant at Grant Park, Ill recently resumed operations. The coming season promises to be one of unusual activity, judging from the amoun of business that is developing in the territory that thi plant serves.

The Hardstone Brick and Tile Company is a newly inco porated concern that will make a sand-lime brick. Whi the buildings and power plant have already been constructe at Clearing, Ill., operations will not be commenced unt machinery, being imported from Germany, has arrived.

The machinery of the Monmouth (Ill.) Clay Manufa turing Company will in the future be driven by electricit due to a partial electrification of that company's plan completed recently by the public service company of thi city. The current will also be used for lighting purpose

The Cole Creek Clay Works, a new, modern and we equipped plant built at Peoria, Ill., by Barthol Rapp ar Sons, opened up recently. Six months have been give over to the construction of this plant, it being the on one in Illinois containing machinery with which to make gas from coal for fuel in the kilns.

Spring is opening up with a heavy demand for face-brick, according to J. W. Moulding of the Thomas Moulding Brick Company, Chicago, and the prospects are bright for heavy sales thruout the remainder of the year. The fire-brick department has nothing to say. It is too busy trying to supply the demand.

A new thirty-six-foot round down-draft kiln with a capacity of 50,000 four-inch tile, is being built at the St. Anne (Ill.) Brick and Tile Company's plant. This company has enjoyed a good business during the past year, but expects a bigger volume of sales in 1916, judging from the number of orders already received.

The city council of Moline, Ill., at a special meeting held recently decided to pave Fourteenth street, from Seventh to Twelfth avenue, and Eighth avenue from Third to Seventh street, with brick. The majority of the new pavements that have been laid recently in this city have been brick, and have given the best kind of service.

The Monmouth (Ill.) Clay Manufacturing Company plans to reopen its plant shortly. Extensive improvements have necessitated its being idle for several weeks, but as these are about completed, it will soon reopen with a force increased by the addition of fifty men, to take care of the large number of orders now being received.

The demand for paving-brick in Illinois and Indiana is now very active. While the later part of 1915 found all but two or three plants in this territory closed for a lack of storage space, a demand has arisen that will consume nearly every paver on hand at a good price. The majority of the paving-brick plants in the Middle West are running to capacity. F. W. Lucke, a Chicago paving-brick dealer, predicts an unusually prosperous year for this class of material, not so much in Chicago as in the outlying country.

Chicago will be the scene of considerable municipal building during the coming year. Herman L. Matz, vice-president of the S. S. Kimbell Brick Company, Chicago, states that stocks are hardly sufficient to meet the demand. A bond issue, passed last year, provides for the construction of from fifteen to twenty fire engine houses in which brick will be used both inside and out. The building of apartment houses has become quite active, requiring a large quantity of brick.

After a long period of strenuous competition between asphalt and paving-brick, the contract for paving Irving Park boulevard, Chicago, Ill., was finally let on April 3, calling for paving-brick as the material to be used. Considerable agitation in favor of asphalt delayed the letting of the contract, but this obstacle was overcome by members of the Paving Brick Publicity Bureau when a delegation of property owners was taken to Detroit, and Cleveland to prove that brick streets are "best by time's test."

INDIANA

The Indiana Brick Company of Anderson, Ind., resumed operations recently with a force of one hundred men. Many large orders are on hand, the outlook for the coming year being especially bright.

The Gary Sand Lime Brick Company recently moved its plant from Highlands to Millers Station, Ind., and has started operations in its new location with a greatly enlarged capacity. The plant is now producing 60,000 brick daily.

The Loogootee (Ind.) Face Brick and Tile Company has been incorporated with a capital stock of $50,000 to manufacture and sell brick, hollow-tile and drain-tile.

THWING HIGH RESISTANCE MULTIPLE RECORD
PYROMETERS

Never Sleep

If the burner knows that his work is being

Recorded in Ink

every few minutes, he will stay **On the Job.**

Multiple Recorders reduce the cost of installation.

How Many Kilns Have You?

Thwing Instrument Company
437 North Fifth Street
Philadelphia

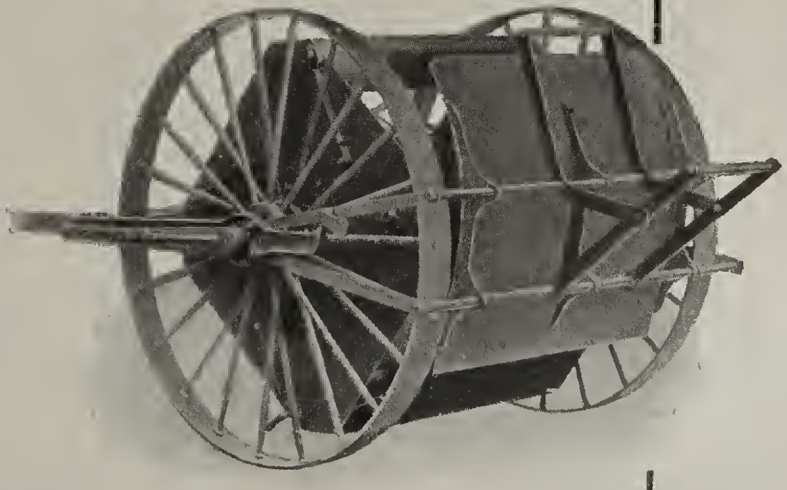
To cut in two the cost of gathering clay or shale from the field—use

THE QUINCY IMPROVED CLAY AND SHALE GATHERER

We guarantee that it will save one-half of the cost of doing this work over the ordinary methods, such as drag or wheel scrapers, wagons or shovelers.

They are used today in practically every state in the Union. The gatherer picks up the dry clay and it is mixed thoroly.

Write at once to the



Lechtenberg Bros., **Quincy, Ill.**
Successors to the Central Iron Works

"Bolt It to the Bin"

The Columbus Feeder

for automatically feeding

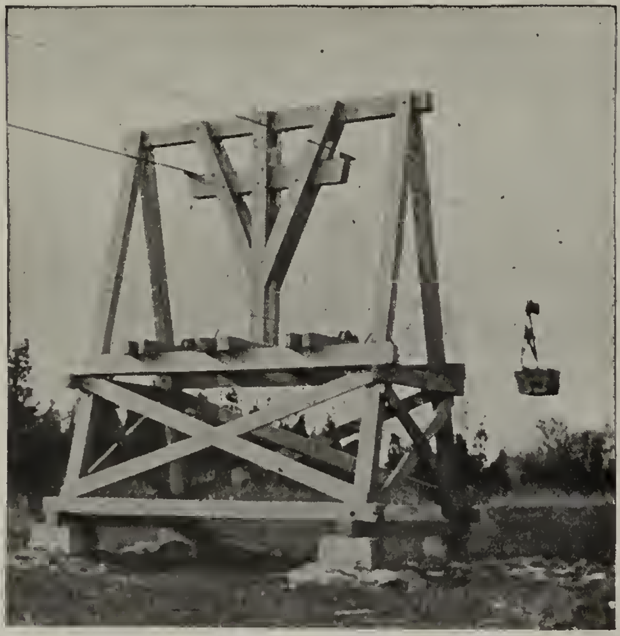
Crushed Clay to Dry Pans *and* Pulverized Clay to Pug Mills

is fast coming into general use. There's a reason. Let us show you—furnish the machine on trial.

Send for Circular.

Ceramic Supply & Construction Co.
Columbus, Ohio

If the Grade is Sufficient— Gravity Supplies All of the Power



B. & B. Friction Grip Aerial Tramway

requires only one man to operate it, will work regardless of bad weather, any capacity desired. It is perfect in construction, simple to operate, maintenance cost is low. Outline your haulage conditions and we will gladly estimate the cost and possible savings to you.

Ask for Catalog No. 16.

BRODERICK & BASCOM ROPE CO.
New York ST. LOUIS, MO. Seattle

The directors are: Thomas H. Browning, John O'Brien, Gustave M. Risacher and Edward A. Morse.

The Hydraulic-Press Brick Company of Brazil, Ind., has been awarded a contract for 125,000 light-colored rough-textured face-brick to be used in the construction of the Senior High School in that city. The Brazil Clay Company will furnish the brick to be used in the walls of the gymnasium.

IOWA

The Maxwell (Ia.) Clay Products Company's plant, under the management of Pearson Brothers, has been made the subject of several improvements recently. The output has been materially increased, a ready sale of hollow-tile being realized.

Business during 1915 was the best since 1909, and 1916 promises to be still better, both in drain-tile and hollow-tile sales, writes C. R. Madson of the Algona (Ia.) Brick and Tile Works. The company expects to increase its drying capacity about one-third in the near future.

KENTUCKY

The Paducah (Ky.) Clay Company has just completed the installation of a hoisting machine at its clay pits near Briensburg, Marshall county, Ky. The new machinery will increase the company's output by a large figure.

Reports from the Building Inspectors' office show that Louisville is doing considerably more building of small structures this season than last. In February a gain of about one hundred and ninety per cent in building was shown in comparison with about twenty-five per cent for the country as a whole. March permits are far more numerous, but will not run as high in value as those of the third month last year.

The Tyler Building Supply Company, Louisville, Ky., has just completed arrangements whereby the company will hereafter be local agents for two well known lines of face-brick, namely, those of the Hocking Valley Products Company, Greendale, Ohio, and the Warren B. Ferris Brick Company, Columbus, Ohio. Leo M. Parsons, an officer of the company, reports that March sales have shown an increase of about one hundred per cent over the same period of last year.

The Red Brick Company has been organized by James H. Kitchen, Wm. Mead, Ed. V. O'Kelly, L. N. Davis and others, for the purpose of leasing for a period of years and operating the plant of the O'Kelly Brick Company, Ashland, Ky. Improvements which will double the capacity of the plant are now under consideration. Continuous operations are assured for this plant in view of the great demand for its product existing in that territory.

According to some of the leading brick manufacturers and building material dealers in Louisville, there is a decided car shortage threatened for that district. One concern recently reported that it was able to get only sixteen cars a day to handle an output which usually requires from twenty-five to thirty cars to move. Supply jobbers are impressing upon contractors the advisability of ordering supplies early in order to avoid any delay in their work.

A. P. McDonald, salesmanager of the P. Bannon Pipe Company, Louisville, Ky., reports the closing of two exceptionally large contracts during the latter part of March. One of these is for several cars of large sewer-pipe to be used on F street. The contract calls for eighteen, twenty-four and thirty-inch pipe. The other is for 70,000 vitrified paving-brick to be used in extending the walls of Cave Hill Cemetery. Mr. McDonald reports an excellent demand for hollow-tile.

LOUISIANA

Delatte and Lagrange, who operate a large brick plant at Lake Charles, La., have secured the contract for furnishing one million common-brick for the new Lucher-Moore factory at Orange, La. This order will keep the plant running for about six weeks. Adolph Lagrange states that business conditions in his territory are very favorable.

With orders on hand calling for about ten million brick, and with a large hollow-tile order, E. H. Michel, of the Salmen Brick and Lumber Company, New Orleans, La., believes that a good year is in sight. The new plant of the company now being erected at Slidell will be in operation by April 15. The other two plants, one at Slidell and the other at Tickfaw, are being operated day and night.

MICHIGAN

The Colonial Brick Company, a face-brick selling concern, was organized in Detroit, Mich., recently with a capital stock of $10,000. Harold W. Holmes, formerly president of the American Face Brick Association, is an interested party.

The Sibley (Mich.) Brick Company, whose plant is located about twelve miles from Detroit on the Detroit River, has been reorganized with a capital stock of $20,000. The new incorporators are William Clippert, Elmer Gorelflo and A. F. Ritchie. It is the plan of the new owners to operate the plant on a larger scale than ever before. Many improvements will be made at once.

MINNESOTA

Altho the Farmers' Clay Products Company, of Minneapolis, Minn., has been organized but a short time, it reports a volume of business that is greater than its capacity. Originally formed to supply farmers in the territory surrounding the twin cities with drain-tile, it has quickly built up a business thruout the Northwest. The plant is equipped with gas-burning kilns having a capacity of 175,000 pieces of four-inch drain-tile. The plant is now operating day and night.

The Hutchinson (Minn.) Brick and Tile Company has increased its capital stock to $200,000, and is building an addition to its plant that will substantially increase the output. A spur has been built from the railroad, over which shipments can be made directly from the kilns at a great saving in time and expense. M. C. Madsen, founder of the original company, has been elected president; William E. Harrington, vice-president, and Walter T. Madsen, secretary and treasurer. Other interested parties are H. H. Ames and F. N. Moore.

A new concern—the Minnesota Stone, Brick and Tile Company—has entered the brickmaking field in the Northwest. This company has absorbed the business and plant of the Belle Plain (Minn.) Brick Company located about thirty-five miles from Minneapolis, the plant being formerly operated by Albrecht and Son. F. C. Ball of Minneapolis, is temporary president of the new corporation; Carl C. Wheat, secretary and treasurer, and J. W. Mitchell, formerly of Lincoln, Neb., is being retained as organizer. John W. Kemp has been appointed superintendent. Permanent officers will be elected in the near future. In addition to the Belle Plain plant, the company will build another near Hopkins, about fourteen miles from Minneapolis, where it owns fifteen acres of land. Orders have already been obtained for about three million common-brick, the greater part of which will be used in St. Paul and Minneapolis.

MISSOURI

Post Brother Tile Company of Commerce, Scott county,

flex

The arrangement of the Heating System in a drier has much to do with the drier's success with different varieties of clays.

One big feature of The Standard Heating System is its **extreme flexibility of arrangement,** which makes it adaptable for the drying of **all varieties** of clays.

The Standard Heating System can always be arranged to suit the special requirements of any clay, and to meet any steam conditions.

This is an interesting phase of the brick drier proposition—one that it will pay you to consider. We shall be glad to send you complete information.

Write for our catalog, which tells all about The Standard Natural Draft Steam Drier. Address: The Standard Dry Kiln Co., 1540 McCarty St., Indianapolis, Ind.

ible

The Factory—perfectly appointed and equipped to care for your orders in a thorough manner.

We have—

Friction Hoists for Clay Plants. (Single or double.)

Waste Heat Fans. (Original builders.)

Superior Grey Iron Castings, one pound to ten tons.

Radial Silo Cutting Tables. (One-man machine.)

We have on hand one 75 and one 250 H. P. Stationary Steam Engine; one C/L 4½ Dble. Strength Blk. Pipe in lengths slightly over 12 feet. Never used.

All cheap—get particulars.

Crawford & McCrimmon Co.

Clay County **Brazil, Indiana**

"A Pyrometer with a Conscience"

IT IS THE

Beighlee

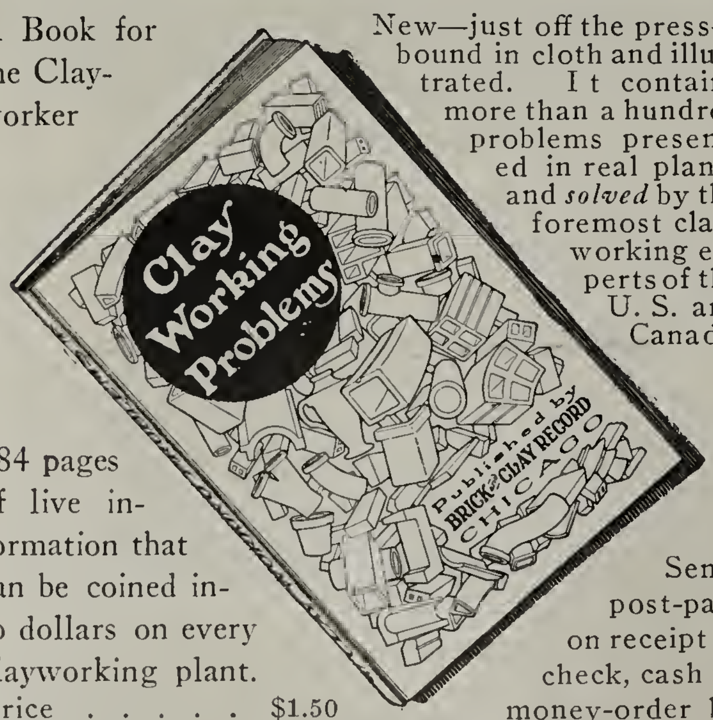
A Big Impressive Instrument

—made so sturdily that it resists rough handling.
—made so perfectly that it records perfectly year in, year out.
—equipped with a compensating device that compels your serious attention.
—equipped with the largest recording dial in existence (in itself a guarantee against errors, for a small dial CANNOT record accurately).

We say it has a conscience—we mean it. We go further—we say it is the best in the world—we can prove it.

Beighlee Electric Company, Cleveland, O.

Gibb Instrument Co., Highland Bldg., Pittsburgh, Pa.
Representative in Pennsylvania and Virginia
Herman A. Holz, Hudson Terminal Bldg., New York City
Representative in New England States



Clay Working Problems
Published by BRICK & CLAY RECORD CHICAGO

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101 Questions Answered

A Book for the Clay-worker

New—just off the press—bound in cloth and illustrated. It contains more than a hundred problems presented in real plants and *solved* by the foremost clay-working experts of the U. S. and Canada.

184 pages of live information that can be coined into dollars on every clayworking plant.
Price $1.50

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Brick and Clay Record
445 Plymouth Court CHICAGO

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Mo., has recently been organized with a capital stock of $20,000, by L. W. Post, C. M. Wylie and M. P. Post. The new concern will manufacture and deal in drain-tile, sewer-pipe and other clay products, and will mine clay.

NEW JERSEY

The Craigen Brick Company of Cliffwood, N. J., has been incorporated with a capital stock of $50,000. The incorporators are: Frank J. Bell and Charles Franck, Jr., of Scardale, N. Y., and George M. Craigen of Brooklyn.

The Standard Hollow Tile Company is the name of a new corporation at New Brunswick, N. J., organized with a capital stock of $25,000, for the purpose of dealing in hollow-tile and terra-cotta. The incorporators are: John W. Helm, Emily M. Netzel and Eleanor E. Daire.

NEW YORK

Brickmakers of Kingston, N. Y., are opposing the construction of an overhead transmission line from that town to Saugerties. The line would pass too close to their clay banks and, as clay is a good conductor of electricity, the lives of the workmen at the various plants would be endangered.

OHIO

The capital stock of the Euclid Stone and Brick Company of Cleveland, Ohio, has been increased from $50,000 to $125,000.

The Mohawk Clay Products Company of Monroeville, Ohio, has increased its capital stock from $25,000 to $50,000.

The Hanover (Ohio) Brick Company reopened its plant recently with a full working force. The prospects for an active year are very bright.

The Coshocton (Ohio) Brick Company has been incorported with a capital stock of $50,000. R. M. Love, J. D. Severns, B. F. Cotter, A. W. Holmes and Joseph Love are interested in the company.

The Colonial Company of East Liverpool, Ohio, reports the heaviest volume of business for February that has been recorded for several years. A large number of orders has been booked and all indications point to a steady run during the entire season.

The Columbus Brick and Terra Cotta Company, which has operated for some time at Union Furnace, Ohio, has closed down its plant for an indefinite period. It is understood that the reason for the move was that the location of the plant rendered it impossible to produce and market the product and compete on a favorble basis with other manufacturers.

The new display rooms of the Cleveland (Ohio) Brick Sales Company have been completed in the offices of the company in the Scofield Building. The work was done under the personal direction of Manager H. F. Kemper. The most conspicuous feature of the display is that eighty different kinds of face-brick are shown. This is a large number for the space used. This company anticipates the biggest spring business in its history.

Prospects were never better for a good business in Dayton for clay products manufacturers, judging by the size and quantity of plans under way for municipal improvements. Bonds to the amount of $365,000, voted some months ago, will be sold shortly, the greater part of the proceeds being allotted by the city commission for streets and sanitary sewers. This means that about half of the issue, at least, or in the neighborhood of $200,000, will be spent for work involving the use of clay sewer-pipe or brick.

While activity in Cincinnati building is rapidly increasing,

unfavorable weather has been a depressing factor and has held work back considerably on all of the jobs under way, at the same time preventing builders from getting started. This makes it the more apparent that, when the weather becomes more favorable, brickmakers are going to have their hands full, as many good-sized contracts are now awaiting the delivery of material, while the number of contracts covering small jobs, such as residences, stores and so forth, being let is large.

The congestion of traffic existing at most of the important industrial and terminal points, as a result of the inability of the railroads to take care of the business offered them, is already affecting building progress, especially in the difficulty experienced by face-brick men to secure deliveries. One of the leading brick companies in Cincinnati (Ohio) expressed the opinion recently that the condition of traffic is going to be a factor of considerable seriousness before long, and in the meantime, indicated his intention of doing everything possible to secure large stocks of his principal lines.

OKLAHOMA

The recently organized Muskogee (Okla.) Vitrified Brick Company has increased its capacity to 90,000 brick a day, employing a force of sixty-five men.

The Reliance Brick Company of Kansas City, Mo., has recently taken over the Oklahoma City (Okla.) office of the Kansas Buff Brick and Manufacturing Company, R. L. Byram being made manager in charge of that office and the territory it serves. These offices, together with a third located at Wichita, Kan., have for their territory the states of Kansas, Missouri, Oklahoma and Arkansas.

OREGON

Phil. Withycombe, proprietor of a drain-tile plant at Yamhill, Ore., is planning the installation of machinery for the manufacture of brick.

A soft-mud brick machine with a daily capacity of 60,000 was recently installed at the plant of the Bend (Ore.) Brick and Lumber Company, of which A. H. Horn is owner. The installation of this machine, together with other equipment, was necessitated by an unusual activity in building in that city. While this plant has not as yet opened for the season, over one-half of its 1916 output has already been sold. Important among the orders on hand, is one for 300,000 brick to be used in the construction of a large business block at Bend.

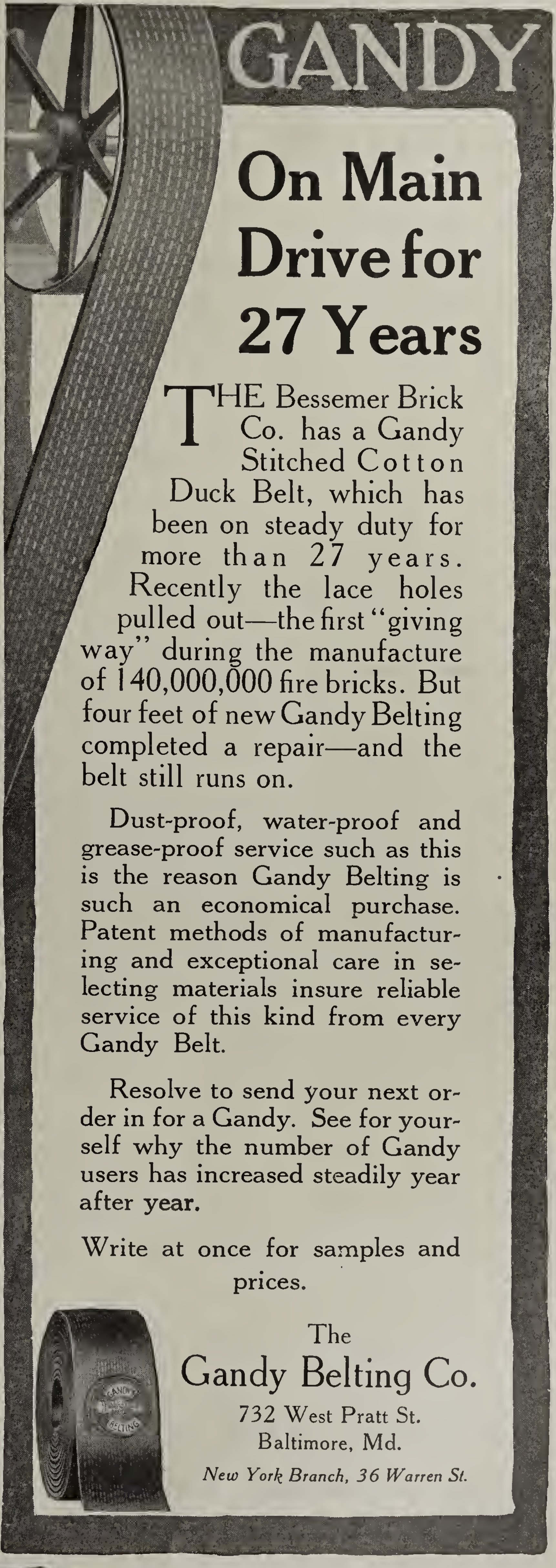
PENNSYLVANIA

The Leiby and Landis Brick Company of New Cumberland, Pa., has a sufficient number of orders on hand at the present time to keep the plant running continuously for some time.

C. D. Gelbach, recently made superintendent of the Mars (Pa.) Brick and Tile Company, reports a good demand for the company's product, which is a red common-brick. Two up-and-down-draft kilns are new additions to the plant.

The Peerless Clay Products Company has been incorporated at Philadelphia, Pa., with a capital stock of $250,000, to buy and sell clay products and other building materials. The incorporators are: Conrad H. Miller, Audubon, N. J.; N. J. Curtis, Hutchinson, Pa., and Frank S. Ritter of Philadelphia, Pa.

The Clydesdale Brick and Stone Company is constructing a large brick plant at Ellwood, Pa., for the purpose of manufacturing paving and building-brick. The plant is



GANDY

On Main Drive for 27 Years

THE Bessemer Brick Co. has a Gandy Stitched Cotton Duck Belt, which has been on steady duty for more than 27 years. Recently the lace holes pulled out—the first "giving way" during the manufacture of 140,000,000 fire bricks. But four feet of new Gandy Belting completed a repair—and the belt still runs on.

Dust-proof, water-proof and grease-proof service such as this is the reason Gandy Belting is such an economical purchase. Patent methods of manufacturing and exceptional care in selecting materials insure reliable service of this kind from every Gandy Belt.

Resolve to send your next order in for a Gandy. See for yourself why the number of Gandy users has increased steadily year after year.

Write at once for samples and prices.

The
Gandy Belting Co.
732 West Pratt St.
Baltimore, Md.
New York Branch, 36 Warren St.

BRICK PLANTS

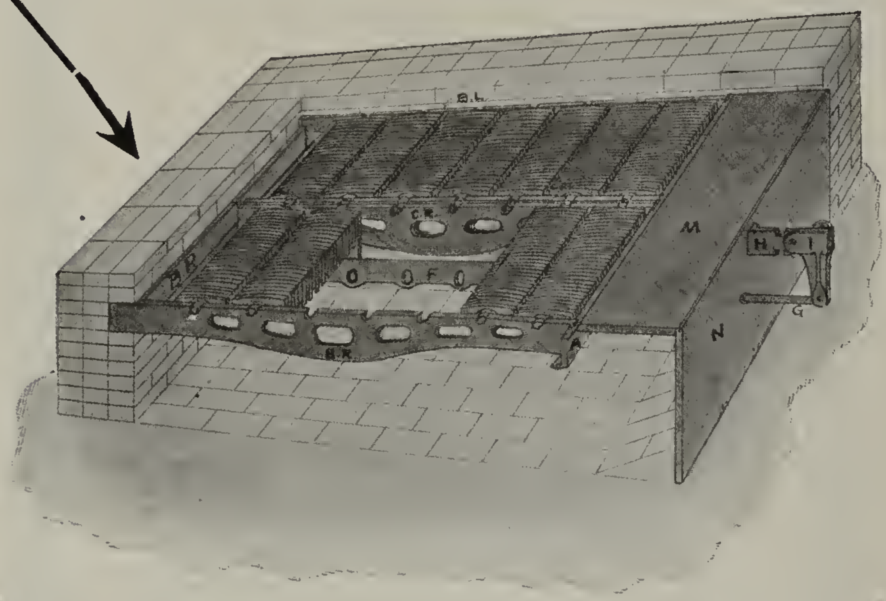
Are Installing

CYCLONE GRATES

Not only because they are sold on ninety days' trial, but principally because in practical every day use they have proven their right to these claims:

1. Even distribution of draft.
2. No fuel gets into ash pit.
3. Locks level.
4. Burns cheap fuel.
5. No fingers to burn off.
6. Impossible to warp.

Isn't This the Kind of Grate You Want?



We can afford to sell the Cyclone Grate on 90 days' trial because of our confidence in our ability to make good on all our claims.

Why not write for our complete catalog?

CYCLONE GRATE-BAR CO.

BUFFALO, N. Y.

situated on the P. and L. E. railroad and conditions existing in that territory promise a good future for the industry.

It is rumored that Harrisburg and Carlisle financiers, who have been prospecting for clays near Dillsburg, Pa., have recently discovered some deposits. An old brick plant built there several years ago may be remodeled for the purpose of refining the clay, which, if suitable, will be offered to manufacturers of clay products.

A contract for a large brick chimney at the paper-mill plant of the New York and Pennsylvania Company, Lock Haven, Pa., was recently secured by the Centre Brick and Tile Company of Orviston, Pa. Buff-colored radial brick are being used in the stack, which is 255 feet high, having a diameter at the top of fourteen feet.

RHODE ISLAND

Preparations are already under way for starting up the plant of the Ashaway (R. I.) Clay Works for the year. As soon as weather conditions permit, the clay pit, now filled with water to a depth of from four to fifteen feet, will be drained. Other improvements will be made by the new management that has taken over the plant.

The plant of the Barrington (R. I.) Steam Brick Company was badly damaged by fire on the morning of March 17, the loss being estimated at $12,000. The fire apparently started in the engine room, consuming the entire building. Only the smoke stack, a few pillars and the machinery remain. The latter is believed to have been damaged beyond repair. Preparations had been under way for some time for the reopening of the plant, and it is thought the blaze might have been due to spontaneous combustion in oily waste in the engine room. The kilns and the office building, which are located some distance from the machine room, were not damaged.

SOUTH CAROLINA

The Columbia (S. C.) Clay Company has been incorporated with a capital stock of $200,000 to manufacture and sell brick and tile. Edward H. Titus, W. F. Blackburn and A. T. Blatchford are interested parties. The plant of the company is located at Eau Claire, near Columbia.

TENNESSEE

W. F. Houck, formerly of Bluefields, W. Va., who was recently made manager of the Southern Tile and Brick Company's plant near Jackson, Tenn., is about ready to reopen the plant which has been closed for some time. This conconcern specializes on fire-brick, having large beds of fireclay in the vicinity. The present capacity of 20,000 brick a day will probably be increased in the near future.

TEXAS

The San Antonio (Tex.) Sand-Lime Brick Company reports that the demand for its products is much improved over the same period last year. The company expects to add one or two new presses to its equipment in the near future. The new owners, who are now in charge of the plant, are George Potchernick, president, and W. G. Sinclair, secretary and general manager. R. L. Cameron has been engaged as salesman to travel the company's territory, which is constantly growing.

A report from Port Arthur, Tex., states that it is almost assured that the city will have a $25,000 brick and tile plant by the middle of April. Warren McDaniels, a building contractor, states that he will soon start the organizing of a company to take a lease on certain tracts of land between

Port Arthur and Port Natches. T. A. Bartlett of Malakoff, Tex., president of the Texas Tile Product Company, has been in Port Arthur conferring with Mr. McDaniels and, altho he would not make a definite statement, indications are numerous that his company will locate a plant in Port Arthur.

UTAH

The Standard Kieselghur Company has been incorporated at Salt Lake City, Utah.

The Smithfield (Utah) Brick and Tile Company has installed a new brick and hollow-tile machine and other equipment that will enable it to better handle the large amount of business that it is now receiving.

The Ashton Fire Brick and Tile Company recently purchased the plant of the Leek Brick Company, Ogden, Utah. Extensive improvements are being made, which, when completed, will make this plant one of the finest in the West.

VIRGINIA

The Hopewell (Va.) Brick Corporation, a brick manufacturing concern, has been incorporated with a capital stock of $25,000. The officers of the company are Harold Sjhemwell, president, and Hugh H. Browning, secretary. Both men are from Petersburg, Va.

J. C. Robinson, of the Clay Products Corporation, Hampton, Va., reports that business is good and that his company has recently installed a new brick machine which is also equipped for making hollow-tile. In addition to this a new six-track steam drier has been added to the plant. The company expects to increase its battery by the addition of a round kiln in the very near future. Most of the kilns on this plant are of the up-draft type.

WASHINGTON

The National Brick Company has been incorporated at Spokane, Wash., with a capital stock of $30,000, by Irene Hoare, J. L. Trone and B. W. Young.

An increase in wages and an addition of ten extra men at the plant of the American Fire Brick Company, Spokane, Wash., is a pretty good sign that prosperity has hit the Far West. Plans are now being considered for the addition of two new kilns to take care of an increased output of interlocking tile.

WEST VIRGINIA

The Maryland Coal Company of West Virginia, with offices in New York City, will break ground immediately for the construction of one of the largest fire-clay products plants in that part of the country. Fire-brick, hollow-tile, fire-proofing, sewer-pipe, paving-brick, enamel face-brick, glazed face-brick and interior glazed tile will be made by the most modern machinery and appliances. The plant will be electrically driven and a coal mine will be developed for its fuel requirements. J. W. Galloway is president of the enterprise.

Prospects are fine and more inquiries are being received for back-up tile than can be handled, writes J. H. Maxwell, president of the Barboursville (W. Va.) Clay Manufacturing Company. During 1914 this plant tried out a new gas burner on its kilns, which has proved entirely satisfactory, saving about twenty-five per cent in fuel. These burners were placed on the five kilns at this plant, which have a capacity of from 300,000 to 400,000 brick, cutting the burning time in half. A small kiln for burning drain-tile is to be erected within the next two or three months. Hollow-tile was added to this company's lines during the past year, and plans are now being

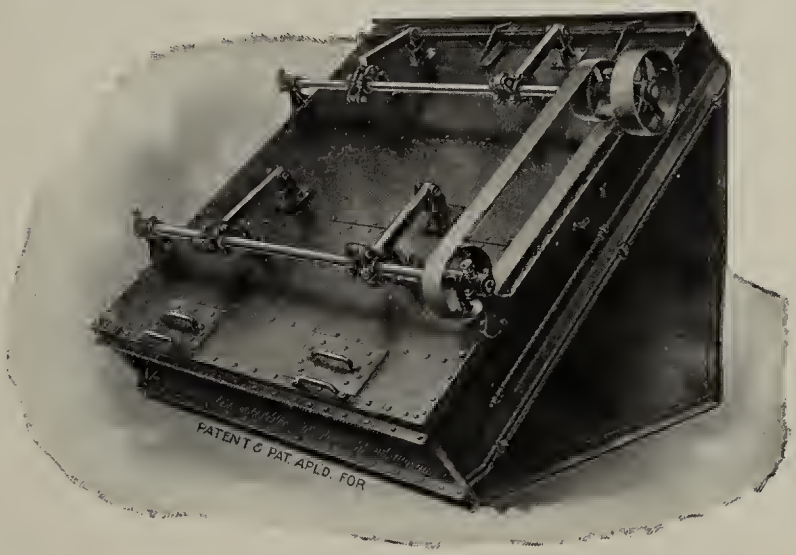
STURTEVANT - NEWAYGO
CLAY SCREEN

A Cause—

No piano wire or perforated metal screen can compete, either for Capacity, Accuracy, Small Power of Upkeep with the Newaygo.

The Newaygo is equipped with a wire cloth screen at a 45° angle. This screen is rapidly, yet not destructively vibrated, preventing a clogged screen. This ensures open meshes which means large output.

A steel case encloses screen, making it practically dust-proof.



A Result—

Dozens of very high class clay plants are using the Newaygo. Read this letter from one of them:

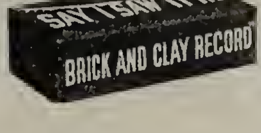
DIDIER-MARCH COMPANY.
Perth Amboy, N. J., March 25, 1913.
Sturtevant Mill Company,
Harrison Square,
Boston, Mass.

Gentlemen: We beg to acknowledge receipt of your favor of the 21st inst., and in reply, beg to advise you that we have found the Newaygo Screen, which we recently purchased from you, a very efficient and economical Screen and one far superior to the general type or revolving screen. We therefore do not hesitate to recommend same for economically screening crushed brick and clays.

Very truly yours,
Didier-March Company,
(SGD) Louis A. Witte, Const. Engr.

Send for Catalog—today

STURTEVANT MILL CO.
BOSTON, MASS.



The lasting impression made by a poor record of results, by any claims unsubstantiated, would have made it an impossibility for us to place

Sixty-five Hook Kiln Installations in the Northwest Section of Ohio

The idea was not adopted by all the plants immediately—only after due and careful consideration.

Today there are sixty-five in one small Ohio section, and over one hundred others in the balance of the states.

Our kiln has met with this exceptional favor because it does give wonderful results in time and fuel saving, and improves the quality of the ware.

We want to tell you why.

Hook Patent Kiln Co.
VIGO, OHIO
CANADIAN OFFICE
250 Dufferin Street Toronto, Canada
Hook Kilns are operated all over the Central West

considered for the addition of rough-textured face-brick to go with the building tile.

WYOMING

The brick plant located at Basin, Wyo., was recently purchased by Charles Galusha, of that city. Mr. Galusha is very optimistic about the future, stating that the plant will be operated to full capacity thruout the season to fill the orders already on hand, one of which calls for 1,230,000 brick for a sugar factory being built at Lovell, Wyo.

POTTERY NOTES

A Resume of the Activities of the Potters and Some Mention of Their Plans for the Future

In the pottery industry just now one hears that never before were working potters so scarce. Plants could use more workers if they could find them, and changes from one pottery to another are frequently made. As all plants in the county are active, and the number of available potters is limited, factory managers do not know where to turn for workmen. In spite of predictions made several months ago, there are no wage disturbances, an element which for a time caused some annoyance. The men seem to be content with full working time at the rate they now receive. This, it is well known, is the highest paid in the world for the same work.

The Sanitary Manufacturing Company of Hamilton, Ohio, was purchased by the Sanitary Manufacturing Company of Kenova, W. Va., recently and will be moved to the last-mentioned place. A number of new articles will be manufactured, labor-saving appliances installed and the capacity of the plant greatly increased. The Kenova plant, to which the purchased plant will be added, consists of seven modern brick buildings with a total floor space of 110,000 square feet. The officers of the new company, which has been incorporated with a capital stock of $300,000, are O. M. Blake, president; H. D. McClintock and H. R. Wyllie, vice-presidents; J. G. Smith, salesmanager; D. E. Abbott, treasurer, and J. H. Davis, secretary and general manager.

The coal settlement reached by committees of the United Mine Workers and the operators of western Pennsylvania, Ohio, Indiana and Illinois, calls for an advance in wages and a change in the general method of paying miners. Pottery users of coal have already been notified of a general increase in the price effective when the mid-summer contracts expire. A number of potteries in the East Liverpool district use coal as fuel and so will be effected. It is only another instance of the steadily rising tide of cost that sooner or later is going to lift the prices of domestic ware.

General ware potteries in the East Liverpool (Ohio) district, including those of West Virginia, have announced that the one per cent discount heretofore allowed in thirty days has been withdrawn and accounts made thirty days net, with five per cent added to all invoices. The steady advance in price of all materials entering into the manufacture of tableware was given as the cause. It is the first general advance in tableware for many years,

altho there have been frequent advances in the price of particular articles.

A proposal has been made to the board of trade at Massillon, Ohio, for the erection of a $200,000 general ware pottery. The promoters who are announced as practical men, have asked the residents to subscribe $90,000 of the common stock, and indications are that this will be done. The plans, as presented to the board, call for a modern plant with seven kilns. The promoters state that two hundred and fifty persons will be employed at this plant, receiving wages totaling $300,000 annually. The town will offer the company a factory site of six acres.

A kiln containing more than 12,000 pieces of high grade laboratory ware, such as has been formerly imported from Germany, was emptied recently at the Coors' Pottery, Golden, Colo. Manager Herman Coors says that the kiln turned out exceptionally well, more than ninety per cent of the ware being perfect. Much of it has already been ordered. Nearly every day the new company is receiving orders for special designs from chemists and scientific investigators who believe that the domestic product is as good as that formerly imported.

East Liverpool (Ohio) pottery manufacturers are utilizing the parcels post to send samples to all parts of the country. This is proving to be a very effective and economical way of getting samples into the hands of prospective buyers in good shape and unbroken when the proper attention is given to the packing of the ware. A recent consignment of this sort was sent out by the Edward M. Knowles Company of Newell.

Western manufacturing potters continue to book business in the hope that factory capacity will permit them to fill orders in due time, but just now they are heavily loaded with business, with much more in sight. The demand is not taking any particular form. All classes and grades of ware are being ordered. Never before were the potteries so busy, and never before has the output been so large.

Pottery salesmen are invading the Canadian market and predictions are that the total business done with firms across the border this year will break all records. American pottery is well known in Canada, but now more than ever is being shipped into the Dominion.

Cartwright Brothers Pottery Company, East Liverpool, Ohio, has added another kiln to its plant and has just opened a casting shop. Frank A. Leonard, who for a number of years was connected with the C. C. Thompson Pottery Company, recently joined the selling force.

It is reported that two kilns are to be erected by the Carrollton (Ohio) Pottery Company in the very near future to take care of its steadily increasing business. The Albright Pottery Company, of the same city, will also increase its kiln capacity.

Plant No. 1 of the Western Stoneware Company, Monmouth, Ill., is running full force with business on the increase. It is probable that when plant No. 2 reopens, which will be very shortly, it will manufacture a new line of ware.

The National Pottery Company of Brooklyn, N. Y., has filed a certificate of incorporation with a capital stock of $10,000. The directors are: Hulda Herrnstadt, Benjamin R. Senberg and Oscar E. Herrnstadt of New York, N. Y.

The Whitehall (Ill.) Pottery Works has been enjoying unusual success in the production of whiteware during the past few weeks. Enough orders are on hand to keep the plant busy for some time.

MERELY debating the matter in your own mind will never enable you to understand the full measure of burning economy that is characteristic of the

Underwood Producer Gas Burning System

Patented

For Periodic Kilns

But if you will let us debate it with you, our arguments cannot help but turn you from a skeptic to a believer.

If you really are in the "doubting Thomas" class and must see before you believe, then why don't you investigate the matter fully by visiting one of the plants at which this system is installed and regularly operated and bringing to its users a saving that is astounding?

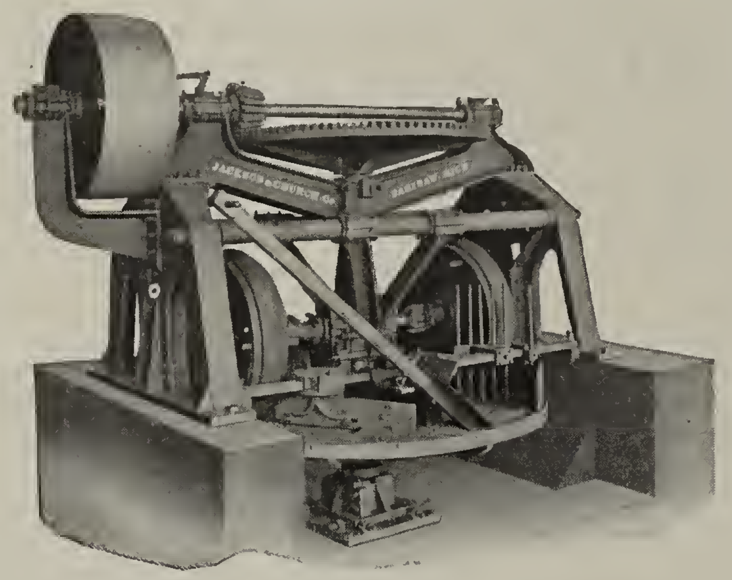
If you don't know how to reach these plants let us give you full directions.

The Manufacturers Equipment Co.

Everything for the Clayworker

Dayton, Ohio, U. S. A.

Geo. H. Smith, Western Representative
510 Reliance Bldg., Kansas City, Mo.



Grinding Pan

Wet or Dry

Especially rugged and substantial. Nine-foot size weighs 40,000 lbs. Large shafts with bearings close to point of labor. Accessible adjustable step box. Extra heavy mullers and wear plates of hard white iron. All parts interchangeable. Repair parts always in stock and low in price.

Jackson & Church Co.

Saginaw, Mich.

Builders of a complete line of machinery for making Sand-Lime Brick. Boilers, Rotary Dryers and Kilns, etc.

MACHINERY *and* EQUIPMENT

Descriptions of Machinery and Accessories and Detailed Announcements that Our Advertisers Believe will Interest Our Readers

---

Like Kelly Does

A. & W. Cooper, Detroit, Michigan, dealers in brick and other clay products, have used a Kelly truck satisfactorily for two years.

In a brief letter they have the following to say regarding their experience:

"We use this truck principally for hauling face-brick, and after two years' experience can say that it has proven very satisfactory to us. We use the truck in conjunction with our teams, using the teams for work on short trips and in muddy streets while we use the truck for the longer runs on the pavements. Up to a distance of about a mile and a half the cost of delivery is the same for teams and the truck, while over this distance the truck gains rapidly on the teams. This is, of course, due to the large proportion of time consumed in loading and unloading the truck on the short trips.

"Then the truck is a big help in giving service to our customers. We usually keep two skilled helpers on, in addition to the driver, and find that these men make a much better looking pile at the job, and chip fewer brick than the average teamster.

In busy seasons you can crowd your truck and get much more extra work out of it than you can by crowding teams. An order calling for a haul of five or six miles or more would tie a team up for half a day, at least, while the truck can do this in less than two hours' time, which is an important item when people are crowding you for deliveries.

"If you are unloading cars at the various team tracks in the city, the truck can get there and be at work in half an hour, while it takes a team two hours to go out, and two hours to come home again at night."

Have you sent in your address so that you may receive "Like Kelly Does," the motor truck publication of the Kelly-Springfield Motor Truck Company, Springfield, Ohio?

A Ten-Hour Drier

John C. Boss Company of Elkhart, Indiana, has on the market a new type of drier. It is a series of tunnels, in which the hot air is admitted from bottom flues running the full length of the tunnel.

The hot air passes vertically thru the ware, carrying off the moisture and passing out thru flues in the roof.

The tunnel is completely filled before the heat is turned

The Kelly Truck Owned by A. & W. Cooper

on. No horizontal draft is secured and therefore the air laden with moisture, from one car of ware, does not bathe the adjacent cars. All the moisture and gases pass out directly above the point of inception.

Ten hours is all that is required by this drier to thoroly dry the product.

Kiln Coal

The coal advertisement that is often used, "Quality, Preparation and Service," is more of a reality with the Rutledge and Taylor Coal Company of St. Louis and Chicago, than a mere advertisement.

Three basic facts make this statement possible. First—In the Nokomis and Livingston mines is found a very high-grade coal, relatively free from impurities. Second—the R. & T. company have built wonderful, modern plants for the mining, preparation, cleaning, sizing and loading of a naturally high-grade coal. Third—Location on the Big Four, C. & E. I. and I. C., gives the mines shipping facilities that are rarely paralleled.

The sequence then is a logical one and means the complete service that is your right to expect.

Good coal, correctly prepared, and delivered just when you want it, is service—it is coal service—it is Rutledge and Taylor guaranteed service. You have it when you get your coal from their mines.

Long flame, quick ignition, low ash and clinker, is your necessity. It is inherent in their coal. Ask for particulars.

A Green-Brick Conveyor

This next year will undoubtedly show a scarcity of labor. It will be hard to obtain under all conditions, and consequently any device that will lessen the amount of labor required, while increasing the first quality ware, will be a boon on many soft-mud plants.

These conditions are admirably filled by Anderson's Brick Conveyor System. It will improve the quality of the ware by practically eliminating chipped and smashed ware. It also eliminates the trucker from machine to drier.

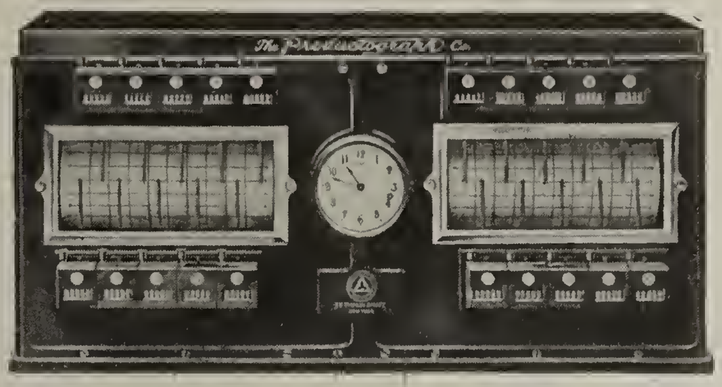
On the ordinary sized yard it saves from four to five men, while accomplishing an equal amount of work.

The machine ordinarily pays for itself during the first season and then pays dividends. For further particulars address The Marinette Iron Works, at Marinette, Wis.

Hyatt Roller-Bearing Wheelbarrow

The Continental Car Company, who for a number of years has been furnishing small dump cars to a great many clay manufacturing concerns, has for some time been supplying its customers with different types of barrows especially built for their particular needs. It has found that very few concerns have the same ideas about the construction, balance and capacity of a barrow, but owing to the large number of brick barrows supplied clay manufacturers from Connecticut to Colorado, this company has endeavored to standardize a barrow incorporating as many of the good features as possible of the many

Wheelbarrow Recommended by the Continental Car Company for Use by Clay-products Manufacturers



This is the Machine

of which the Straitsville Impervious Brick Co. say:

"We have been operating the PRODUCTOGRAPH for a number of months now and it has been giving us very satisfactory service. It has taught us some things about our machine room which we did not know before--things that we should have known, but did not know, and which it has paid us well to find out. The PRODUCTOGRAPH, we find, is quite some little teacher, and for those who will care to follow, it will point the way constructively. We doubt if there is a brick plant in the country which could not learn something which it would be to its advantage to know from the use of a PRODUCTOGRAPH."

The PRODUCTOGRAPH gives you a mechanically accurate record of lost time, productive working time, average speed and output. This information will enable you to eliminate the faults that now retard production and reduce profits.

Literature and full information upon request.

The Productograph Co.

30 CHURCH ST. SLOCUM-AVRAM-SLOCUM MANAGEMENT NEW YORK, N. Y.

McManigal's

Super Heating System for

Down Draft Kilns

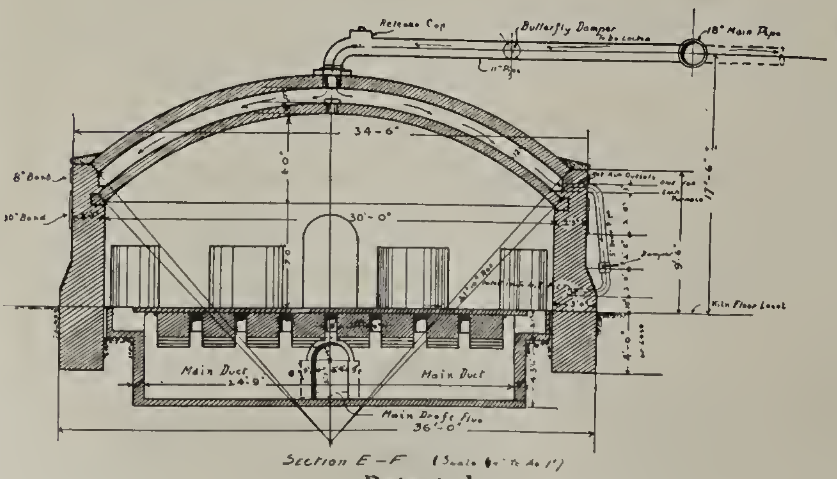
It has made another record.

We told you previously that it was burning paving brick in 5½ days, saving two days in time and at least 30% of the fuel.

The latest record is to burn shale paving block at a total cost of $0.97, reduced from $2.00 per 1,000.

Write immediately to the

McManigal Grateless Furnace Co.
Logan, Ohio



Patented

It can be built on your present kilns.

different types of barrows it has built for the industry.

Brick barrows are subject to extremely hard usage, and as a rule are very carelessly handled and improperly taken care of. It is false economy to use a barrow built of cheap material and improperly put together and reinforced. The Continental barrow is not only designed for maximum load capacity, assuring proper balance, but the particular features are the large strong wheels, the rigid steel bracing, and the use of cold rolled steel axles in babbitted malleable bearings, which are self-oiling and grit proof. A large number of barrows also are equipped with especially designed Hyatt roller bearings, at a small additional expense.

Some of the most prominent clay products manufacturers, who have used many other barrows, are unanimous in their approval of the Continental and state that they do not see how the manufacturers can afford to sell them at the price. The secret lies in large production and efficient manufacturing facilities.

Main office and works of the Continental Car Company are at Louisville, Ky.

Wire Rope Data Book

There are very few clay plants that do not use wire rope in some department; in fact, its use is on the increase.

On tramways, inclines, mine lifts, cableway excavators, steam shovels, etc., it is very imperative that the very highest grade of cable should be used. This class of cable is made by the A. Leschen & Sons Rope Company of St. Louis, Mo.

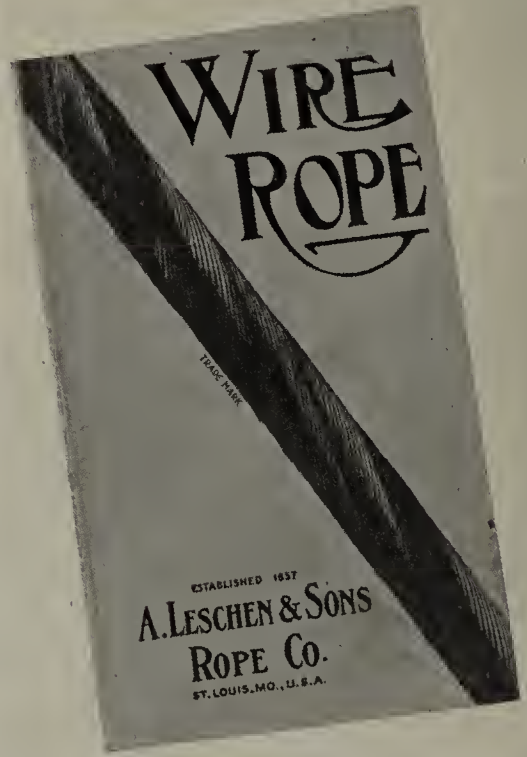
The Leschen company has issued a very instructive catalog showing data tables on its various sizes; also containing information on the care and operation of wire rope.

The catalog and a copy of Leschen's monthly magazine, "Leschen's Hercules," will be sent to you on request.

Morse Silent Chains

The application of Morse Silent Chains for transmitting large powers has come to be recognized, not only as good mechanical practice where the specifications favor such a drive, but as highly desirable, on account of their greater efficiency, quiet operation, low up-keep cost, and long life, in most places where belts or gears could be used. In other words, Morse Silent Chains, by reason of the excellent service already shown, have come to be the favored drive for the larger powers.

Ten years ago, the 100-h.p. silent chain drive was very uncommon, and drives of larger capacities were rarely



Reproduction of the Leschen Book, Which Gives Data on Wire Rope even considered. Today, it is not considered at all unusual to have from ten to thirty drives of 100-h.p. and over in course of construction at one time.

The ordinary advantages of silent chains over gearing, belting, and ropes for the transmission of power are well known to all mechanical men, viz.:

(1) Positive speed ratio between driving and driven shafts, with the added feature of flexibility; (2) 98½ to 99 per cent sustained efficiency; (3) quietness at high speeds; (4) convenience of application; (5) greater reliability; and (6) longer life with lower upkeep cost.

Complete interesting catalogs will be sent on request to the Morse Chain Company, Ithaca. N. Y.

Kaolins and Ball Clays

If you are using any of the clays and materials that are used in pottery, such as kaolins, ball clays, feldspar, etc., you can secure a very complete treatise on the subject by applying to J. M. Mallory, Industrial Agent, Central of Georgia Railway, Savannah, Georgia.

This pamphlet tells of the developed and undeveloped clay lands in the vicinity of Macon, Georgia, giving physical and chemical analysis and a survey of each location. A request to Mr. Mallory will bring it to you.

W. D. Richardson

W. D. Richardson of the Ceramic Supply and Construction Company, Columbus, Ohio, has contracted to assume the plant management of the Hebron Fire and Pressed Brick Company of Hebron, North Dakota, for a term of years.

Mr. Richardson will actively oversee and advise concerning the building and operation of the new Richardson producer gas fired continuous kiln installed at this plant.

He will not sever his connection with the Ceramic Supply and Construction Company, but will continue in an advisory capacity, with H. C. Arnold in active charge.

Knowing Mr. Richardson's broad theoretical and practical knowledge of the clay industry, it is safe to predict a successful sojourn in Hebron.

W. D. Richardson

SMALL COST
LARGE SAVING
In Handling Bricks

From kilns to storage, from cars to yard, wherever bricks are being carried AMCO GRAVITY CONVEYORS will eliminate waste of labor—will save time and overhead.

The cost of the AMCO GRAVITY CONVEYOR is small; the saving great. In a short while they will save enough to pay for themselves.

AMCO CONVEYORS

are easily shipped from place to place and are built in such lengths as you may desire. They are constructed entirely of steel and the steel rollers revolve on case-hardened steel ball bearings.

Write for illustrated catalog and other descriptive matter. Or a member of our engineering corps will call to help you with your handling problems under no obligation on your part.

Partial List of
Users of Amco Conveyors

T. J. Pardy Construction Co., Bridgeport, Conn.
Kendrick, McNell, Davis, Webb Co., Tampa, Fla.
Wm. Crane, Green & Cullen

ALVEY MANUFACTURING CO.
General Offices and Factory
Dept. A., : ST. LOUIS, U.S.A.
New York Boston Los Angeles Chicago

With the coming of the time to make a new coal contract

and the uncertainty of the outcome of the Miner's Wage Controversy now on

it behooves the manufacturer of brick and clay products to have a complete and accurate knowledge of conditions in the coal trade from week to week. Not that he merely knows of those things having a direct bearing upon his business, but that he may prepare himself against any shortage of coal by placing his contract and orders in accordance with conditions.

THE BLACK DIAMOND

for over 30 years the coal trade's leading journal, publishes the greatest amount of news and information pertaining to the situation.

The Annual Steam Coal Contract Number, the March 18th issue contains much in its editorial and advertorial pages that will help you to more economical use and buying of coal for your particular purposes.

May we help you to a more accurate knowledge of conditions in the coal trade, by beginning your subscription with that Number? Costs but $3.00 the year. Issued weekly.

THE BLACK DIAMOND
Manhattan Bldg., Chicago
New York Cincinnati Pittsburgh

Electric Transportation in Industrial Work

Electric locomotives, now available in various sizes and weight, afford the industrial plant the means for solving in an admirably economical manner the problem of transportation of materials and products.

In manufacturing plants where systems of railroad spurs enter the grounds for receipt of materials, the transfer of work in process and the shipment of product, and the shifting of cars to and from the railroad siding and from place to place about the plant, may well be done by electric locomotives of standard gauge, saving the expensive switching charges by the railroad company, while also quickening the work by avoiding waits for the switching engines.

In almost any plant whose extensive character, or distance from a source of raw materials or shipping point, is such as to make a system of narrow gauge industrial railway desirable, one or more electric locomotives of suitable size, weight and type will be of economic value in quickening and cheapening the movement of the industrial cars, as compared to hand pushing or horse hauling.

At brick, tile, pottery and other clay working plants whose materials must be brought from long or short distances, or from scattered points, electric locomotives may properly be used for car handling and hauling.

Electric locomotives for industrial service have numerous advantages. As compared to steam locomotives, they (1) avoid the fire risks which prevent indoor operation; (2) give uniform tractive effort; (3) have higher momentary overload capacity for quick starting; (4) work better on grades; (5) consume no power and require no attention when not actually at work; (6) are easier of operation and control; (7) are operated by only one man; (8) may be run by lower-wage men; (9) are simple and compact in construction, insuring long life and low upkeep expense; (10) are rugged and strongly built, and will endure without injury the abuse due to a greater degree of carelessness in handling, etc.

Goodman Locomotive Hauling Clay Cars

The Goodman Manufacturing Company of Chicago, Ill., are builders of all types of electric locomotives, standard or narrow gauge, trolley, storage-battery or third rail in all weights. A request will bring complete information.

Manganese Dioxide

This ore, commonly termed Black Oxide of Manganese, has been used for many years in both the decorated pottery and face-brick fields.

In face brick it is used to give color to the face, varying from a grey tone to black spots; when in a fire-clay body burning buff to grey.

The color imparted is governed by many points, viz.: the fineness of grain of the black oxide; the natural burning color of the clay body and the degree of temperature reached in the burning process.

Inasmuch as the manganese ore fuses and combines chemically only at relatively high temperatures, it is necessary to make a manganese frit, if desired to get a fused effect at lower temperatures, or if burning red clays with a black synthetic spot.

Ordinarily the bulk oxide is used, and color and distribution secured by weight and a certain prescribed fineness of grain; the oxide usually being added to the clay at the grinding machinery.

E. J. Lavino & Company, Bullitt Building, Philadelphia, Pa., has secured new mines, and with modern preparing plants and exceptional shipping facilities, the company is enabled to supply every want in the clay field along this particular line.

"Straight-Line" Belt Adjusters

The Cleveland Fabric Belting Company are offering their "safety first" belt adjusters on a thirty-day free trial basis.

The Cleveland Fabric Belting Company, Cleveland, Ohio, Can Show This Man the "Safe" and Quick Way to Handle the Belt in Contrast to the Dangerous Method He Is Following

A new pamphlet describing the appliance and details of the offer may be had by addressing the company at 1480 West 110th St., Cleveland, Ohio.

Ball Bearing Brick Conveyors

Every plant, from the smallest to the largest, wherever brick are carried, has use for this great labor-saving device.

It is particularly useful in unloading kilns of face or paving brick in order to sort and grade the ware outside in the daylight. In this class of unloading and in loading cars it is a speedy and cheap method.

Particulars can be obtained by addressing the Alvey Manufacturing Company, Department A, St. Louis, Mo.

That General Store

For some months "Brick and Clay Record" has been conducting a "general store"—a page of ads devoted to advertising the accessories that are used on practically every plant.

Have you noticed it? Will you turn to it and note the value and quality in the goods displayed on the shelves?

Boiler compound, belt lacings, babbitt, valves, repair work, chains, belt dressing, chain hoists, gas engines and rebuilt machinery, coloring—all important, all of them possible needs on your plant.

Turn to that page and study it thoroly. You may find just what you want.

A new booklet, No. 238, describing two popular styles of Link Belt grab buckets has just been published by the company.

If you do use or could use grab buckets, a postal card request to the Link-Belt Company, Chicago, Ill., will bring you description and photos of new, superior types.

A new catalog is just published detailing briefly the various temperature measuring devices and all accessories that are made by the Brown Instrument Company of Philadelphia, Pa.

A feature is the new recorder, and full information is yours for the asking.

Something to ponder over.

Shows what is being done in The PROCTOR.

In One Plant

Safely drying NINE DUCT conduit in six hours.

Former time — four days.

Another Plant

Drying safely in twenty-four hours; former time—eight days.

Another

Drying safely in twelve hours. Former time — forty-eight.

Still Another

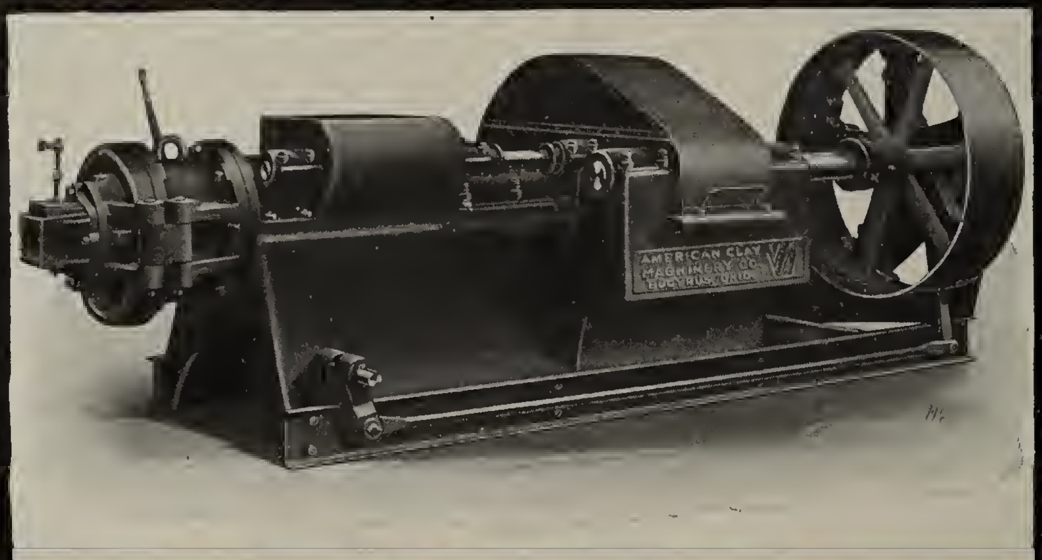
Drying safely, thoroly, four-inch drain tile in just ONE hour.

The Philadelphia Textile Machinery Company

Hancock and Somerset Sts.
PHILADELPHIA,
PA.

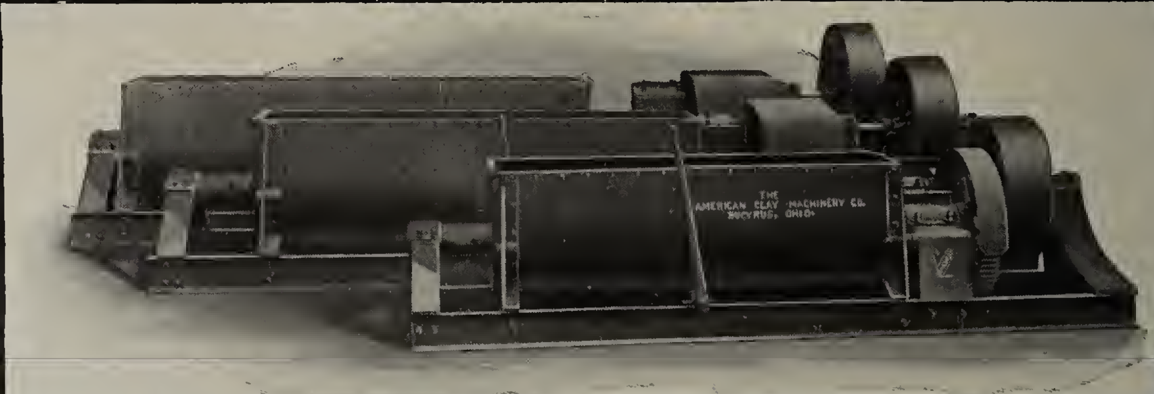
Our Booklet? Better get it.

BUILT RIGHT
RUN RIGHT



Our new line of Auger Machines, Pug Mills, Cutters, Presses, Etc. embody every feature necessary for satisfactory operation.

Complete description of any machine on request.

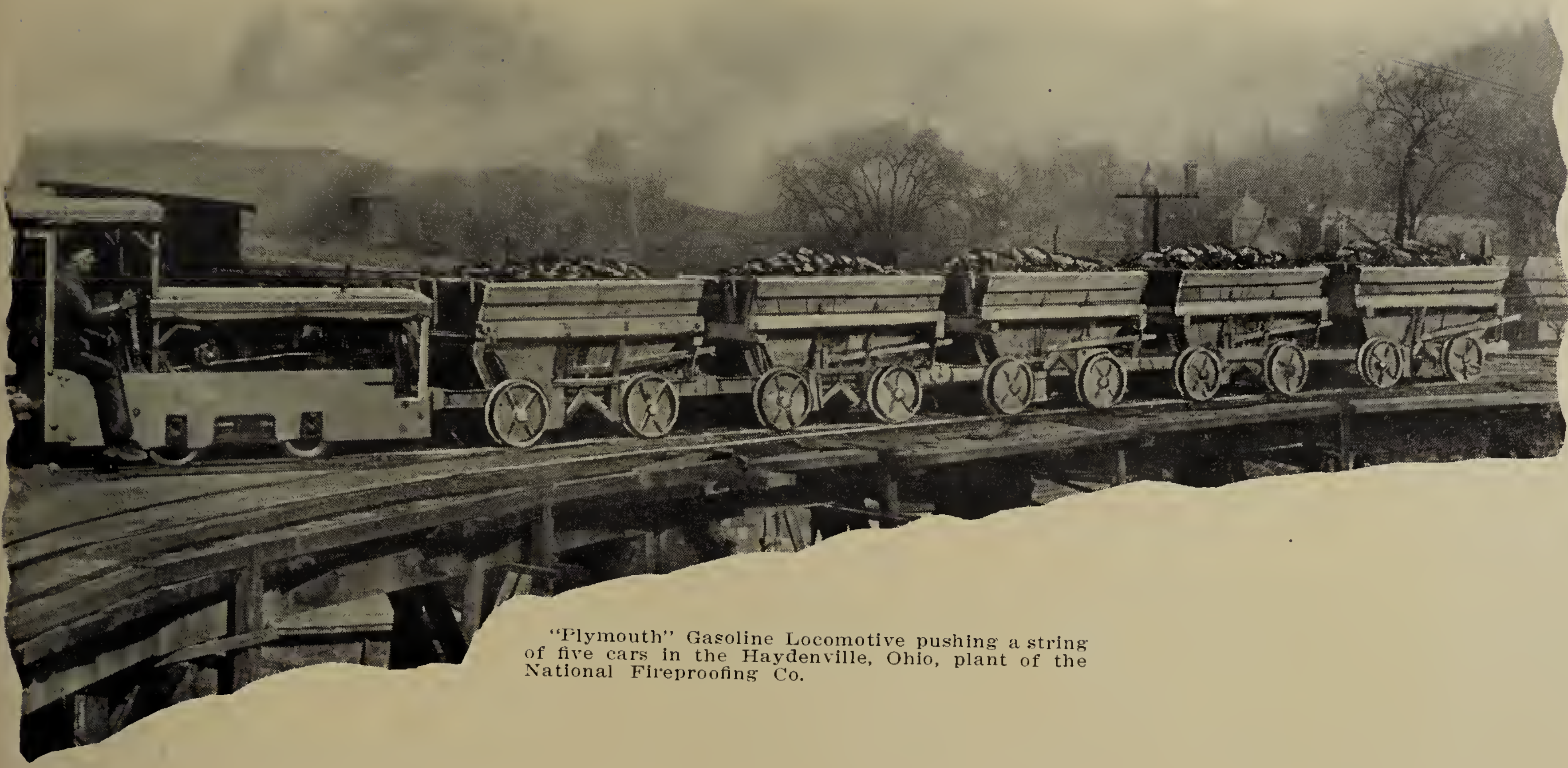


THE AMERICAN CLAY MCHY. CO.

BUILT RIGHT
RUN RIGHT

BUCYRUS OHIO
U.S.A.

SAY "I SAW IT IN" BRICK AND CLAY RECORD



"Plymouth" Gasoline Locomotive pushing a string of five cars in the Haydenville, Ohio, plant of the National Fireproofing Co.

The National Fire Proofing Co. Hauls Clay With a "Plymouth" Gasoline Locomotive at a Cost of $2\frac{4}{10}$ Cents Per Ton

This concern is one of the world's greatest manufacturers of clay products. It has plants located convenient to all the great building materials markets of the United States.

And, naturally, with this wonderful organization, it has solved the cost of production.

In its haulage problem, for instance, the Haydenville, Ohio, plant of the National Fire Proofing Company installed a "Plymouth" Gasoline Locomotive because it satisfied itself that it would haul its raw clay more economically than any other power or system.

"The Plymouth" not only hauls the clay at a cost of 2 4/10 cents per ton, but it is doing more and better work.

The "Plymouth" Can Do This, Because—

1: It uses gasoline—the cheapest of all fuels and does it the "Plymouth" way, which is the cheapest of all gasoline-fuel systems.

2: It uses the "Plymouth" Friction Drive which gives more power per gallon of gasoline, reduces repair bills to the minimum, does not require a licensed engineer or expert to run it and has no expensive gear drive to go out of order or break.

3: It is simpler in operation—has no water or steam gauge to watch—no flues to keep clean—no complicated levers to operate—no dangerous trolley wires to worry about—no short circuits to puzzle—no air tanks—no complicated clutches.

4: It takes a higher grade and pulls a greater load, the "Plymouth" having a heavy iron frame, instead of light steel structure and, therefore, possessing greater traction power.

5: It costs less to buy—less to install—less to operate, the "Plymouth," being simpler in construction than any other locomotive, no matter what the power, has no expensive gears, or transmission, no trolleys, cables or generating plants, no compressed air plants nor any other expensive "extras" so necessary for the operation of other locomotives.

J. D. FATE COMPANY
240 Riggs Avenue - - PLYMOUTH, OHIO

THIS LETTER IS YOUR PROOF

NATIONAL FIRE PROOFING CO. **March 3, 1915**
Haydenville Dept., Haydenville, Ohio

Gentlemen:

"The Plymouth" Gasoline Locomotive has been in operation almost one year and the results have been entirely satisfactory.

In the months of July, September and October, which we selected as being typical of the year, this engine handled 29,591 tons of material at a cost of 2.4 cents per ton.

Its average consumption of gasoline is 5 gallons per day, with about ½ gallon of Polarine and the usual other lubricants for bearings.

Yours very truly,
THOMAS D. BROWN, Manager.

If the Plymouth Does These Things for Others

Is it not reasonable to suppose that it will do as much for YOU? You will admit, won't you, that it is worth at least the trouble of investigating?

Get Book of Facts

We have a book that not only describes in every detail the construction of the "Plymouth," but shows pictures of "Plymouths" in actual work under conditions just like YOURS, and there are records accompanying these pictures which show just what it costs to operate the "Plymouth." You may have a FREE copy for the asking.

Send Coupon

Sign your name and address to the little coupon at the right and attach to your letter head. Drop it in the mail today.

J. D.
Fate Co.
240 Riggs Av.
Plymouth, Ohio

Please send us the "Plymouth Book of Facts." We are interested. This does not obligate us in any manner.

Firm's Name............
Your Name..................
City ....
State ....Street ....

Announcing

The New Worm Drive Trucks

The complete Kelly Line is now made even more complete. Two new worm driven models have been added—the K-32, 1½ ton and the K-36, 2½-ton.

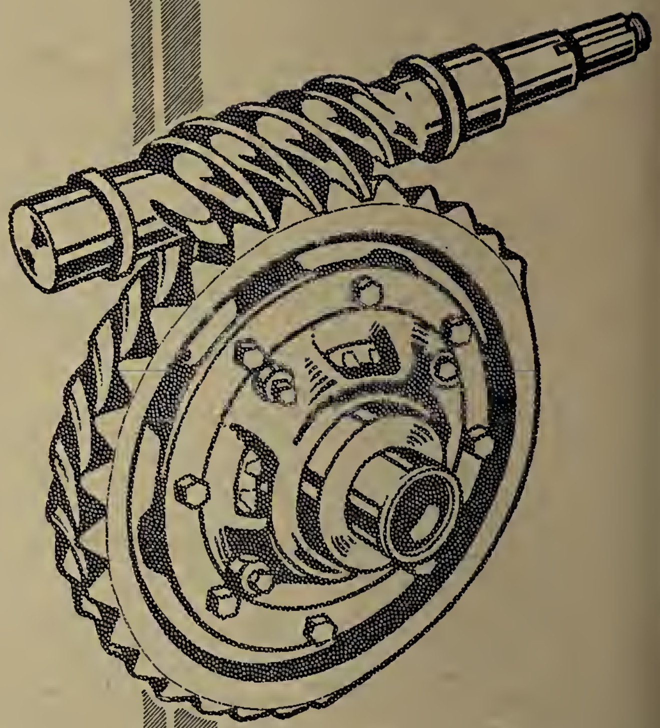
We've perfected a worm drive that satisfies us. It is the development of years of investigation and research carried on by our Engineering Department. We know it to be worthy of the Kelly reputation.

This new Kelly worm drive incorporates only those features proved efficient by experience. The axle shafts are especially rugged and designed with a maximum factor of safety. The fixed hub mounting of the wheel is the last word in up-to-date axle construction. Special features provide a flexible drive.

All built to the Kelly standard. The same Kelly heavy duty motor with its ample supply of secondary power. The same strong, unusually flexible Kelly frame. The low operating cost and depreciation ratio that distinguishes all Kelly Trucks.

Plus—Kelly Service. Organized to serve Kelly users always and everywhere—complete, competent, willing and permanent. We see to it that every Kelly Truck makes good however and wherever employed.

KELLY TRUCKS

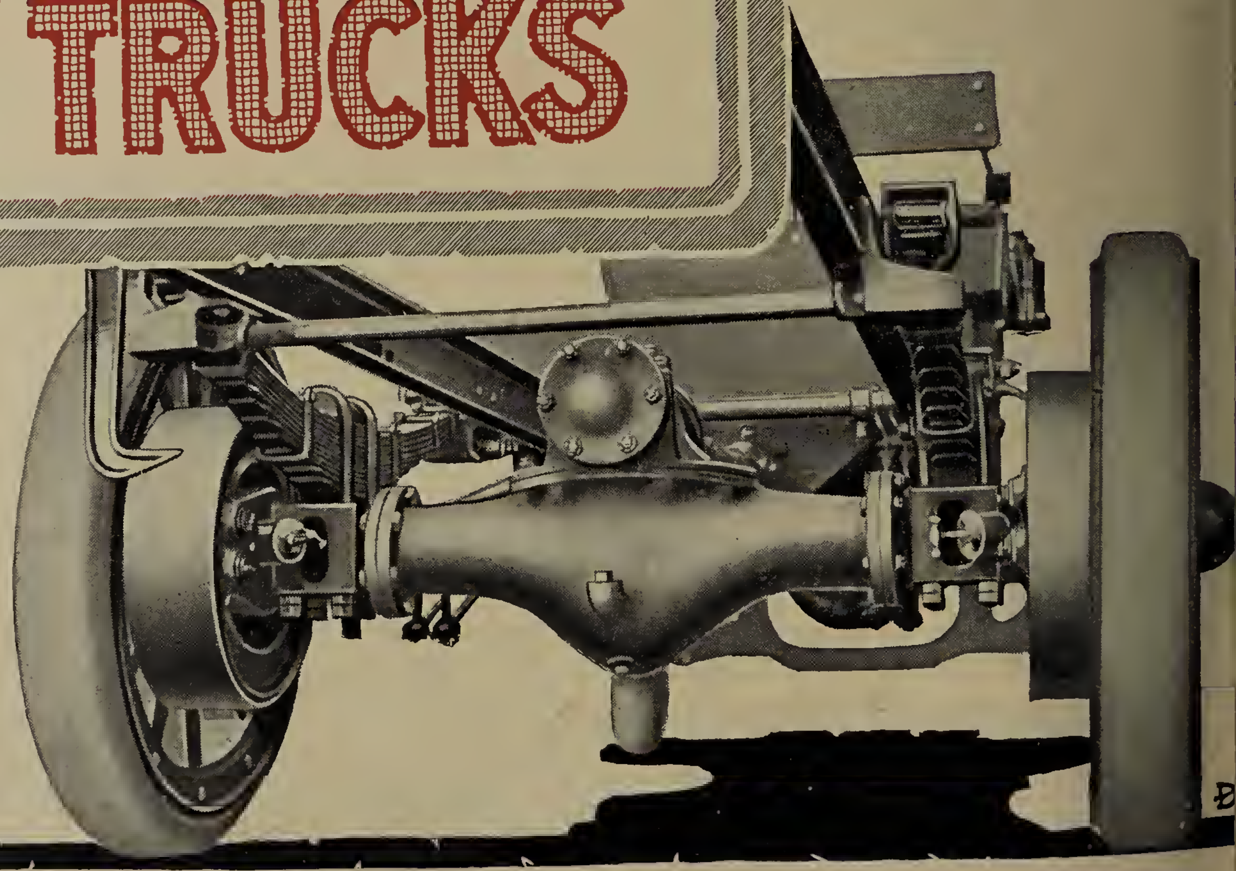


The Complete Line
Worm Drive—
1½ and 2½ tons
Chain Drive—
1½-2½-3½-4-5 and 6 tons

"Like Kelly Does" FREE

We want to put your name on the free list of this valuable monthly publication devoted to truck transportation (not all Kelly). Full of useful information for all truck users—whatever the motive power.

THE KELLY-SPRINGFIELD
MOTOR TRUCK COMPANY
1204 Burt Street, Springfield, Ohio



BRICK and CLAY RECORD

Give Your Horsepower A Chance

Power Saved is Power Earned

"SCANDINAVIA"

SOLID WOVEN COTTON BELTING

IS MADE TO LAST AND OUTLAST

It gives four times better service than the best grade canvas by actual working test. Under conditions where the best canvas lasted only seven months, Scandinavia has been in operation more than 30 months, and is still working.

This particular instance is in one of the largest brick plants in the South, and the master mechanic states "Scandinavia is giving remarkable service, carrying its load better and lasting four times longer than any other belt used under this condition."

It is giving equally as good service in a great many other plants. Scandinavia is the same all the way through—it has no weak spots.

Write our nearest office regarding your conditions

Scandinavia Belting Company

106-108 Reade Street, New York

Branches: Atlanta, Boston, Buffalo, Chicago, Cleveland, Easton, Pa., Pittsburgh, San Francisco, Los Angeles, Portland, Ore.

Canada: Federal Engineering Co., Limited, Toronto and Montreal

Vol. XLVIII, No. 8 Chicago April 18, 1916

WELLER-MADE

WHICH?

Old Style Methods

20 to 25c per ton

To get coal to boiler house and to kilns required two horses, two carts and an average of four men.

For Retail Trade it took wagons or auto trucks from 70 to 90 minutes from time they drove into yard until they weighed out.

Demurrage frequently amounted to from $15.00 to $30.00 per month.

Loss from coal falling between cars and wagons was a serious item.

Loss from theft was large.

In Gondola cars—5c to 10c premium.

New Style Methods

3 to 5c per ton

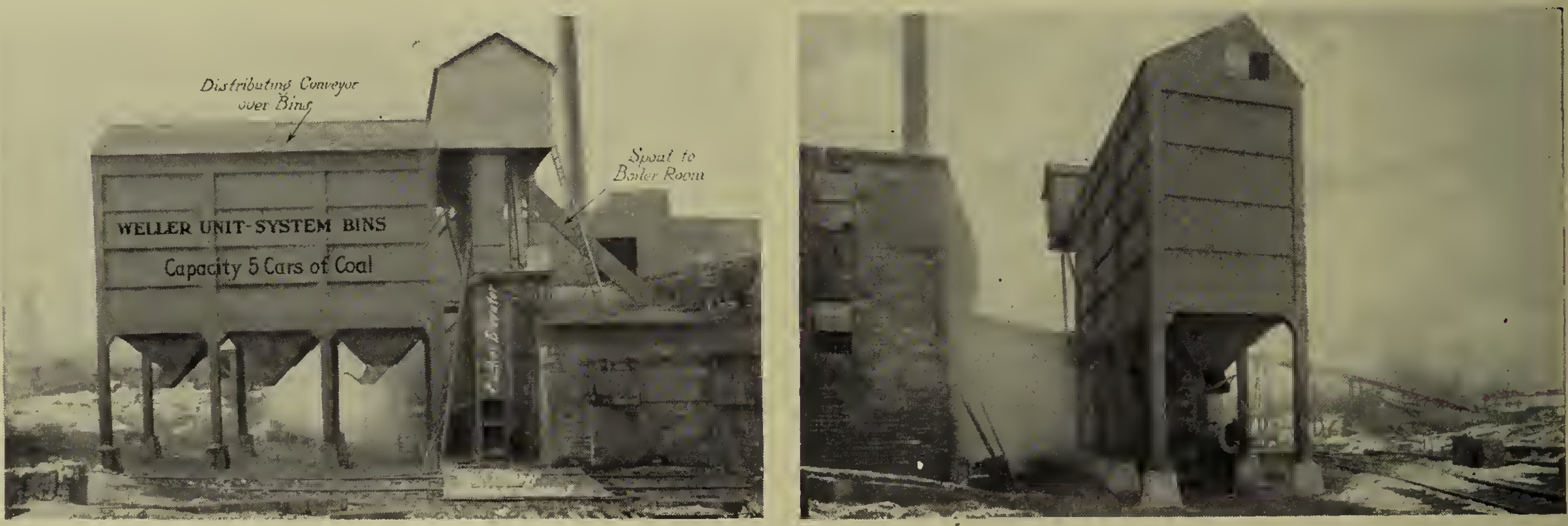
One man, with one horse and cart, supplies all kilns **before noon.** Coal for boiler room is spouted direct, no labor.

Average time regardless of size of load—**10 minutes. Saving one hour.**

Demurrage
Loss } "Ain't none"
Theft

Hopper-bottom cars—saving 5c to 10c.

It is up to you to say what your coal handling will cost



Coal Handling Plant L. W. Camp Co., Akron, Ohio

Each plant has certain peculiarities so that it is impossible to lay down any set rule. Certain general principles are always involved which simply require a combination of certain of our standard equipment properly assembled to meet the conditions.

There is a shortage of satisfactory labor in many localities and if something is not done to offset this condition, many clayworking plants will be up against a serious problem during the coming season and it is better to get ready now.

If it is handling coal, clay, shale or other material around your plant we can and will help if given a chance.

We know how to, and do, build good

Elevating, Conveying and Power Transmitting Machinery

WELLER MFG. CO. **CHICAGO**

BRICK and CLAY RECORD

Entered as Second Class Matter January 2, 1911, at the Post Office, at Chicago, Ill., Under the Act of March 3, 1879.

Terms of Subscription
One Year—(24 Numbers)
United States......$2.00 Foreign $3.00
Single Copies.......25c

Published the first and third Tuesdays of each month by

Kenfield-Leach Company
445 Plymouth Court Chicago

Chicago, April 18, 1916
Vol. XLVIII No. 8

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Standards of Practice for Business Publications

The publisher of a business paper should dedicate his best efforts to the cause of Business and Social Service, and to this end should pledge himself: 1. To consider, first, the interests of the subscriber. 2. To subscribe to and work for truth and honesty in all departments. 3. To eliminate, in so far as possible, his personal opinions from his news columns, but to be a leader of thought in his editorial columns, and to make his criticisms constructive. 4. To refuse to publish "puffs," free reading notices or paid "write-ups;" to keep his reading columns independent of advertising considerations, and to measure all news by this standard: "Is it real news?" 5. To decline any advertisement which has a tendency to mislead or which does not conform to business integrity. 6. To solicit subscriptions and advertising solely upon the merits of the publication. 7. To supply advertisers with full information regarding character and extent of circulation, including detailed circulation statements subject to proper and authentic verification. 8. To co-operate with all organizations and individuals engaged in creative advertising work. 9. To avoid unfair competition. 10. To determine what is the highest and largest function of the field which he serves, and then to strive in every legitimate way to promote that function.

The EDITOR'S CORNER

Comment, Criticism and Advice on Live Issues Affecting the Manufacture, Marketing and Manifold Uses of Burned Clay Products

IF there is one evil in the business of manufacturing brick—or for that matter, any clay product—that is in need of more attention than any other, it is the lack of a knowledge of cost.

Some few manufacturers have excellent systems for keeping account of every penny that should rightfully be charged against the cost of making the product and placing it on the market; a large number have a fairly accurate but incomplete system, while the vast majority of plant owners has absolutely no way of knowing what it is costing them to be in business.

For instance, a drain-tile manufacturer, when asked recently how many tile he took from his kilns in a certain period, said:

"Count the tile as they come from the kiln! I should say not. I have trouble enough in making them without wasting time keeping track of the burns."

How much do you suppose that man knows about his cost when he does not even know the quantity of first-class ware he is getting from each kiln?

Not a few clayworkers claim to know what their manufacturing cost is per unit, whatever that may be, but whenever occasion arises to discuss this important subject, at informal gatherings or in the convention hall, it is surprising to learn what little they really do know.

Those manufacturers who do have a "system" can hardly agree on two or three accounts, while there are a number of subjects relating to cost upon which all seem to be at variance.

The crying need in the industry is for a uniform system of cost accounting so that each and every manufacturer will be keeping his books in exactly the same manner.

The Institute of Paving Brick Manufacturers has started something laudable along this line. At the first quarterly meeting for this year, which has just closed at Portsmouth, Ohio, a motion was passed asking for the appointment of a committee of five to investigate the cost accounting methods of the paving-brick manufacturers who are willing that this should be done, and report their findings to the Institute at an early date, together with recommendations which might lead to the adoption of a uniform cost system.

It is gratifying, to say the least, to see some action started to relieve a situation which has in the past been the source of considerable damage to paving-brick manufacturers. The refractories manufactures have already taken steps looking toward better cost accounting.

It is to be hoped that this committee will begin its work promptly and will push its investigation to a speedy conclusion. If its work results in the adoption of a uniform cost system for the paving-brick manufacturers, the time and expense involved will not be in vain.

Signs of the Times

WHILE nearly two months have passed since convention week in Cleveland—February 20 to 26—it is not too late to touch upon a certain incident that occurred in that city while the brickmakers were exchanging greetings and listening to edifying papers on clayworking subjects.

Most of us do our best thinking when the busy tasks of the day have been put behind and we sit by our own familiar fireside and reflect on what the day has brought, or the week; or perhaps we turn our thoughts back farther into the past, and in our mind react the scenes and experiences of some important event, thinking more clearly and judging more surely of its significance.

It is with this thought in mind that we turn to the address made by F. H. Chapin, manager of the Hydraulic-Press Brick Company's Cleveland office, before the Ohio Association of Retail Lumbermen on February 22.

It is a noteworthy fact that Mr. Chapin appeared on the program of the annual convention of the lumber dealers — not manufacturers — of the Buckeye State at their invitation. The lumbermen are to be congratulated on the broadmindedness of this step. It is a sign of the fast vanishing spirit of competition and the increasingly strong desire on the part of the dealers for co-operation in solving problems of distribution.

Mr. Chapin's address to the lumbermen was purely and simply a brick talk. We shall pass over the first part, which deals with the annual fire loss, figures which are familiar to every manufacturer of burned clay building materials, and proceed to the closing sentences of his speech which contain some thoughts that are interesting, to say the least.

Speaking of the "Henry Ford market" for the brickmaker—the vast number of small residences that are erected each year thruout this nation, mostly by the carpenter-contractor—Mr. Chapin said:

"Cannot we take a far-sighted view of the situation and look a sufficient distance into the future to see that, if this comparative ratio of brick and frame dwellings were reversed, and that anything like eighty-five per cent. of the dwellings were to use brick for exterior facing, that it would be just as essential and just as desirable for the brick manufacturer to market his product thru a number of dealers, as it is now for the lumber manufacturer to do so. That, if the volume of face-brick usage could be developed in these communities to the proportions that are now enjoyed by wood siding and paint, every lumber dealer would find it necessary to carry a stock in his sheds and be equipped to supply all the accessories of the trade. I believe that the brick manufacturers would find him a very convenient, if not indispensable channel thru which to market their product.

"Then it would no longer be difficult for the contractor to carry on the brick jobs because he could be supplied with plans for brick houses if we were co-operating. He (the contractor) would have your service behind him the same as he now has.

"It is not necessary that, because you gentlemen take the designation 'lumber dealer' that you are debarred and perpetually restrained from handling face-brick and kindred materials. On the other hand you are the logical channel thru which all kinds of building material should flow to the consumer. In England one seldom sees the trade name 'lumber dealer.' It is always 'builders' supplies,' and the firm or individual is equipped to handle intelligently and promptly all staples of the trade. I look forward to the time when we will be sending our salesmen around to get your stock brick orders, the same as the lumber salesman now calls upon you, and that our service department will be behind you for co-operation on special work, special sizes, ornamental shapes, and so forth, the same as you now look to the mill people to supply you in that department.

"Personally, I would much rather compete for your business than I would for that of the general public, for then the question of service, of fidelity to a fixed standard of policies and square dealing would mean a lot more in our business than it does today, because we would have a fixed and steady patronage, where today it is spasmodic. Our patrons are widely scattered and only infrequently in the market. The saving that could be effected in the selling expense of brick would, in itself, represent a very considerable profit."

Encourage the Dealer

MUCH has been written and said regarding the marketing of clay products thru dealers. Many arguments have been advanced, both for and against the existence of this unit in the selling machinery, altho it is hardly to be doubted that, where a good force of dealers has been developed, much of the difficulty and expense in marketing brick and other burned clay building materials has been eliminated.

In many large and important industries, the dealer is an essential part of the mechanism of distribution. He is cognizant of local conditions and knows his neighbors better than the salesman of the manufacturer who comes from a distant city at long intervals for a short visit. He cuts the cost of selling to the consumer because he saves the salesman's time. Of course the value of the dealer as a sales agent depends upon his energy and initiative. A "dead" dealer is worse than none at all. Where most clay products manufacturers have "fallen down" as regards the dealer, is in not selecting, first, a live, honest man, and then co-operating with him and protecting him in the sale of his (the manufacturer's) product.

The employment of lumber dealers as agents for burned clay building materials is not a new idea. In many sections of the country the retail lumbermen are handling such ware with success and are providing a stable and sure outlet for a number of clay products manufacturers. In Iowa and southern Minnesota, for instance, most of the drain-tile sold is marketed thru lumber dealers, and this practice has spread to brick and hollow-tile with equal success. There are other states and cities where builders' supply concerns which, in nine cases out of ten means a lumber dealer, have built up a flourishing business in the "best of all building materials" and will continue to develop this business as long as they find it profitable.

That the brick or hollow-tile manufacturer should look to the retail lumberman as a legitimate representative in his particular town is not unreasonable. On the other hand, it is entirely logical. The lumber dealer is not in business for his health, nor because he loves lumber. He sells lumber because he finds that there is a demand for it with its accompanying profits.

If the clay products manufacturer will make it profitable for the dealer to handle his products, he can displace some of the wood that is going into the small homes of this country and gain a valuable ally in the retailer. In order to make his proposition attractive, it is not necessary for the brick or tilemaker to offer his products to the dealer at a low price. While there must be a reasonable margin of profit for the dealer, what he needs more is co-operation in the selling of the ware and in creating a larger demand in his territory. The manufacturer need not sell the dealer's material for him, but he can help him by furnishing good plans for low-cost brick homes, by backing him up with a publicity campaign and by giving him such personal assistance as is necessary to get over hard places in the "road." The lumber manufacturer has done all of this and has won the dealer's confidence.

There seems to be no reason why the manufacturer of clay products cannot take advantage of this established sales agency for building materials—the retail lumberman—and endeavor to show him how he can profit by pushing permanent, fireproof and economical materials.

Help the Blind

ONE of the great difficulties connected with association work—not only among clayworkers, but in every line of industrial endeavor—is the difficulty in giving a wide circulation to the papers that are read at the annual meetings.

If the author be a man of considerable oratorical ability, he may succeed in stirring his audience to action and as a result, someone may arise and—after the usual "vote of thanks," resolve that the speech, paper or article, be printed and *distributed to the membership.*

Now—any association that enrolls more than forty per cent of the individuals engaged in the industry in which it is working, is very fortunately situated. This forty per cent. represents, it is fondly believed, the best and most progressive element in the industry. Consequently, the sixty per cent. that is not included in the membership, is not only relatively important but relatively ignorant.

So the member who has resolved that the speech be printed and *distributed to the membership* accomplishes little.

In fact, he makes it rather unnecessary to attend association meetings since all of the best (or least tiresome) papers will be printed and distributed to the stay-at-homes.

And in the meantime, that relatively ignorant but intensely important sixty per cent knows nothing of the progress of the industry or of the helpfulness of association work and as a consequence, goes right on pulling the industry down, keeping prices at bed rock, and making trouble.

It would seem that every paper that is good enough to be printed is good enough to be distributed *gratis* to every individual that is known to be engaged in that branch of the industry to which the paper has an appeal.

Association work is, after all, educational. To deny its light to those who have not sufficient vision to see the advantages of co-operation is very much like kicking a lame man's crutch.

PAVING BRICKMAKERS

Committee, to be Appointed as a Result of Portsmouth (Ohio) Manufacturers and Report to

Father and Son—M. E. and M. C. Gregory—Getting the Views of Other Members on Cost

A Large Attendance and Fair Weather Favored the First Quarterly Meeting of the Institute of Paving Brick Manufacturers Held at Portsmouth, Ohio, on April 12. Steps were Taken at this Gathering which May Lead to the Adoption of a Uniform Cost System

WITH A DETERMINATION to tear the mask from Cost—that great deceiver of the clayworking industry—the Institute of Paving Brick Manufacturers met at Portsmouth, Ohio, on April 12, with a good attendance. That the "Pavers" were not entirely unsuccessful in their attempt to reveal the true identity of this baffling personage, is shown in the report of the meeting, which is very interesting reading to those who are concerned with the welfare and progress of the industry.

The fact that Portsmouth is somewhat inaccessible, due to the lack of convenient train schedules, did not dampen the ardor of the delegates who, with but few exceptions, were on hand the evening before the day upon which the meeting was held, and what is more unusual, a late arrival found most of them in the hands of the Sand Man.

PLANT INSPECTION MORNING PROGRAM

The morning of the twelfth broke fair and clear, and, after an early breakfast, the visitors, who numbered about forty, were loaded into waiting automobiles and driven out to the plant of the Carlyle Paving Brick Company, east of the city. Under the able direction of G. E. Carlyle, the party first inspected a remarkable shale mine on the property of that company. In order to reach the mine it was necessary to climb half way up the side of a high hill, from which point entrance was gained to the main passageway from which the cars of shale are dispatched to the top of a long chute which extends down the hillside. The most interesting feature of this mine was the roof, which requires little or no bracing and which was cut as smoothly as the ceiling of any living-room.

After inspecting the source of the raw material on this plant, the party proceeded to the grinding department, across the road. Here it was found, as an indication of present market conditions for clay wares, that fire-brick were being made during a lull in the demand for pavers. The company obtains a good grade of fire-clay on its property and, for this reason, it is able to switch from paving to fire-brick without serious inconvenience. In fact, the only change made in the equipment was the relining of the press boxes. This plant has nine rectangular down-draft kilns and when making paving brick, has a capacity of one million a month. The delegates were informed that the pavers made at this plant took a rattler test of fourteen, which is unusually good.

From the Carlyle plant, the party proceeded to the Portsmouth Paving Brick Company, of which G. E. Carlyle is also manager. This plant has about half the capacity of the first one visited, altho it has the same number of kilns, some of which, however, are of the round, down-draft type.

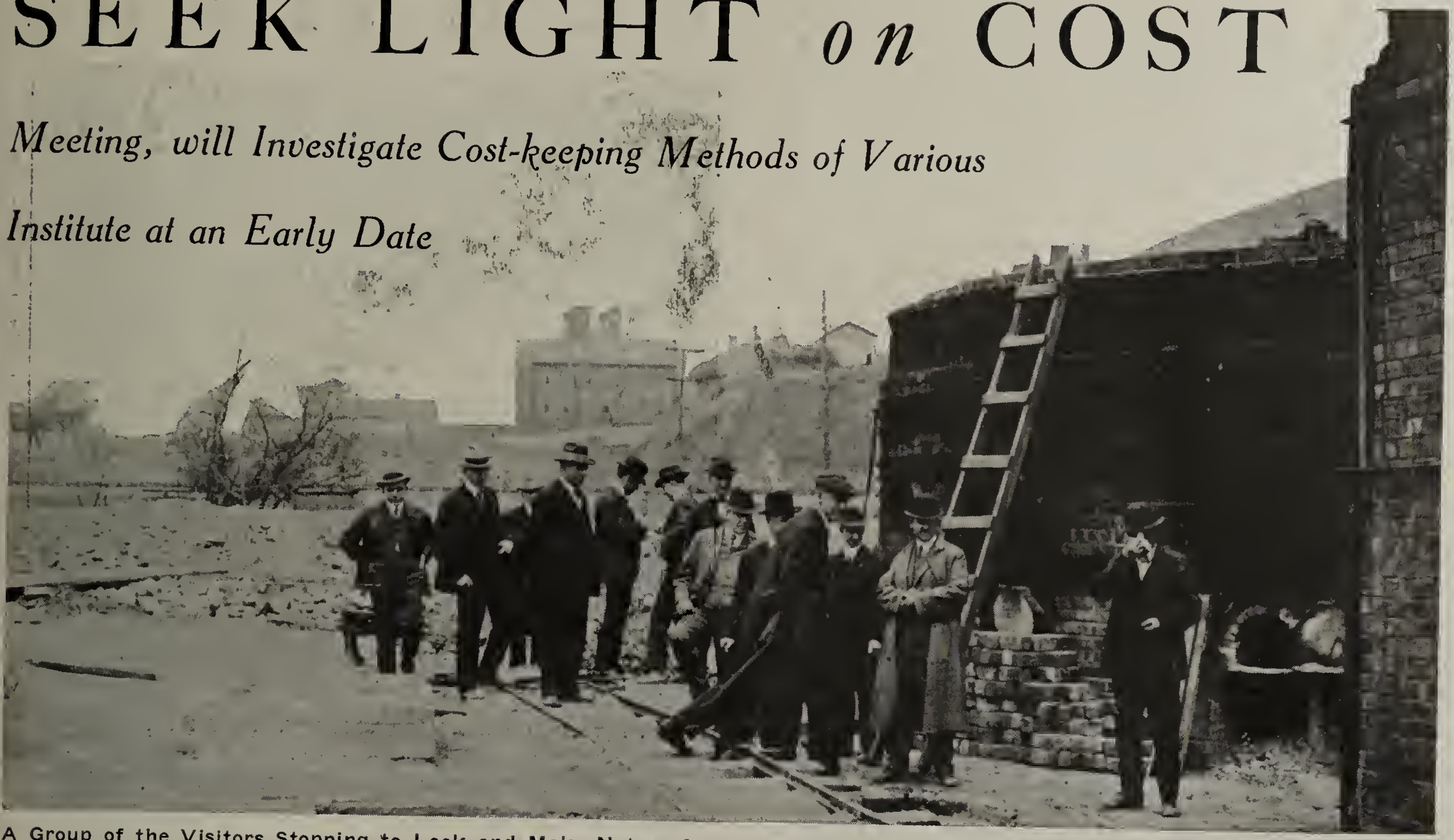
When the visitors had completed their tour of this plant, it was nearly noon and, in order to sharpen their appetites, the party was driven out of town a distance of several miles, along the Scioto River, which furnishes much interesting scenery, typical of that part of the state. After returning to the hotel, the members sat down to a substantial luncheon and were then taken out to the twin plants of the Peebles Paving Brick Company, which are also east of town.

AFTERNOON SPENT AT PEEBLES PLANT

The Peebles plant is interesting in many ways. The shale is won from a pit with very high banks, a powerful steam shovel being used to dislodge the raw material. This company has just purchased a new ninety-one ton shovel, which it will use for this purpose and which also gives some idea of the hard service such equipment receives. From the pit the visitors proceeded to the main part of the plant, which has a capacity of nearly two million wire-cut-lug pavers a month. The original plant had only one-half of this capacity, the new addition being buil within recent years. The feature of this plant which

SEEK LIGHT *on* COST

Meeting, will Investigate Cost-keeping Methods of Various Institute at an Early Date



A Group of the Visitors Stopping to Look and Make Notes of an Interesting Kiln on the Plant of the Portsmouth Paving Brick Company

attracted considerable interest was the sixty-nine chamber continuous kiln having a capacity of about one million brick. Second in unusual features, was the fact that this company uses natural gas—which is plentiful and cheap in that section of the country—under its boilers. The inspection of the Peebles plant occupied all of the afternoon, the delegates returning late in the day to the hotel where, at seven o'clock, a banquet was served, following which the scheduled discussion on cost was taken up.

As was announced, C. C. Blair, general manager of the Bessemer Limestone Company, Youngstown, Ohio, started the program with a paper on cost-keeping. Mr. Blair's paper follows:

HOW ONE BRICKMAKER KEEPS HIS COSTS

The speaker does not propose to enter into a lengthy discussion of the philosophy of costs. We take it that what is more to be desired in a meeting of this kind, is an outline of practical methods, rather than a discussion of ideals.

The principal (I should not say perhaps the only) purpose of the brick manufacturers is to make money. In order to accomplish this where competition is keen and the margins of profit are small, it is absolutely necessary for the manufacturer to have an accurate and proved cost system. The system should show him not only the unit cost, but it ought to present also a clear and vivid picture of plant conditions. It should be in such form that it can be readily used for the purpose of comparison between different departments and between different plants for various periods.

It is vital to know the unit cost, as this is the only true basis for an intelligent selling price. It is necessary to the success of any concern that the selling price be based on cost plus a fair profit, rather than on the selling price of competitors who may or who may not have a proper understanding of costs.

At this point, we wish to make it clear that the cost of a completed article does not end until it is placed on the market. We mean by this, that the sales cost is a proper one to include and must be added to the manufacturing cost. We fear, in fact we know, that the sales cost is overlooked by many paving-brick manufacturers. Let us not forget that the cost continues until the brick are delivered to the buyer.

There are many complicated systems of cost in use by manufacturers in different lines of business, necessarily complicated by the nature and diversion of their product. Brick plant accounting and cost systems for brick plants are comparatively simple on account of the fact that most plants do not make more than one or two different products, and they being so similar, are readily reduced to a common basis.

BASIS FOR SYSTEM FIRST CONSIDERATION

In making up a cost system the first thing to consider is the establishment of a basis from which to work. This may be a tonnage, a block or a standard brick. Many firms are using tonnage and all things considered, we believe this the best where two or more sizes are manufactured. At the present time our company is using the block or ten pound basis, which means practically a tonnage basis.

With the basis established we would divide cost as follows:

First: Direct Labor
Second: Material and Supplies
Third: Overhead or General Expense
Fourth: Depreciation

With these divisions before us, it now seems advisable to outline just what information is wanted for the use of the superintendent and foremen. All detail information is of no use to any one except the superintendent and his assistants. They are the ones who should benefit the most from an accurate detailed cost sheet.

Surprising differences can be noted in the various departments of different plants where they are apparently working under conditions very much alike.

After determining the information wanted, it becomes a matter of detail as to how the information shall be gathered.

For convenience in handling cost items, we have found it very desirable to establish a card of accounts covering all departments and subdivisions. Each separate operation is given a number and is known as for instance, No. 20, instead of machine room labor, or No. 30 for machine room supplies.

This at first may seem a little confusing to the inexperienced, but once learned, it is much the simpler way to handle a large number of detail operations.

This card of accounts should be made to cover every detail of labor, material expense, and depreciation in the manner which it is desired to be shown by those in authority. When the card of accounts is completed in accordance with the plan laid down, we have the outline of a complete cost system.

HOW VARIOUS DIVISIONS ARE HANDLED

We shall now turn our attention to the main divisions of the system. The first division—Direct Labor—from the standpoint of accounting, is the most easily handled, and there is no reason why, with a little care, this should not be kept absolutely accurate. The information wanted may be gathered from time slips prepared by the foreman or timekeeper, or from records kept by the laborers themselves. Our experience has taught us in the interest of accuracy, that the records should be audited by the head timekeeper who checks up the reports daily with the time cards.

The reports are then passed at once to the payroll clerk who enters them on the payroll under the proper cost account, after which a daily statement of labor cost is made. These daily labor costs are very important to the superintendent who, after going over them, is able at once to put his fingers on any unusual condition and, should any department fall below the usual standard, it can be looked after at once. After all time is entered and computed for the month, we are able to obtain from the payroll, the total labor cost for each department and subdivision that finds a place in the system.

Watching a Powerful Steam Shovel Eat Holes in a Hard Bank of Shale

Material and Supplies—the second division or second item of expense—we find a little more difficult to handle. While it can be made accurate over a period of months, there is some use for the imagination in making up the monthly reports.

O. W. Renkert Grew Mighty Thirsty Toward the End of the Inspection Trip

If a storeroom is operated (and we believe a storeroom should be operated, even in the smaller plants) such articles as pass thru and are given out by the storekeeper, can be very well taken care of. Experience will show what per cent., if any, it is necessary to add to different articles to make up shrinkage. Such items as cannot be carried in a storeroom or be under direct charge of the storekeeper, or such supplies as are wanted at the plant for sake of convenience, can be taken care of by monthly inventories. In our plants coal, oil and setting sand are handled in this way. All other items delivered to the plants that are liable to be lost sight of, are charged direct to the cost of the proper department immediately upon delivery. There may be some reasons to criticize the direct charge of articles not used at once, but our experience tells us if this is not done, a large inventory invariably appears where there is no material to take care of it. We have treated this division of costs from the standpoint of supplies. The material purchased which goes directly into the product is practically a negligible quantity in most paving-brick plants. However, if any raw material is purchased it can easily be handled in the manner just described.

This brings us up to the third division—General Expense—which is commonly known as "overhead." This consists of indirect labor, such as machine shop work, office help, salesmen, superintendents and manager. It also includes office supplies and material not chargeable direct, insurance, taxes royalties, association dues, promotion expenses and such items must be included under this head. We do not suppose, where there are two or more plants working under one head, that a system has ever been worked out that has been entirely satisfactory in the division of this expense, but it is chargeable to the product, and we have found it most satisfactory in the long run to divide on a production basis all items that come in for the period of the report. Insurance and taxes can be charged direct to the proper plant but should be apportioned as near as possible each month. There are many things affecting the overhead charge where there is more than one plant or more than one variety of article manufactured. For example, the production of one plant goes up while another may remain stationary or may even decrease. You can readily argue that a plant with increasing product should be given a benefit as against a plant whose product is stationary or decreasing, but taken from month to month in a well regulated concern this will adjust itself or reach such a stage that some other basis for division must be used. If the cost system is a proper one the condition first described will be discovered in time and remedies effected that will make a new basis unnecessary.

FEW AGREE ON DEPRECIATION

This brings us to the fourth division—Depreciation. From talks I have had with different manufacturers, I am led to believe there are almost as many methods of handling this as there are companies operating.

For many years our company took inventory of all plants and properties at the end of each business year and charged off a certain percentage. At present we are charging to depreciation on plants and machinery at a certain rate per thousand block and we have considered applying the same method to our raw material supply. We would not advocate an excessive depreciation charge that would wipe out the investment in the few years, and we just as certainly take issue with those who do not make any charge for this item but claim to keep their plants up to standard at all times and count them as good as new. This is a very common practice for those who are just starting in the business with new plants. If this practice is followed, sooner or later the owner is going to wake up and find his supposed profits are nothing but a run-down plant. When a certain machine or kiln, or anything else around the plant reaches the stage where it must be replaced, we find our plant depreciation very convenient. It takes care of replacements without disturbing current costs and we consider it perfectly proper to make use of it in this way. We do not wish to be misunderstood on this point. Replacements are handled entirely apart from our ordinary plant maintenance and repair which are legitimate cost items and can not be drawn upon for replacements.

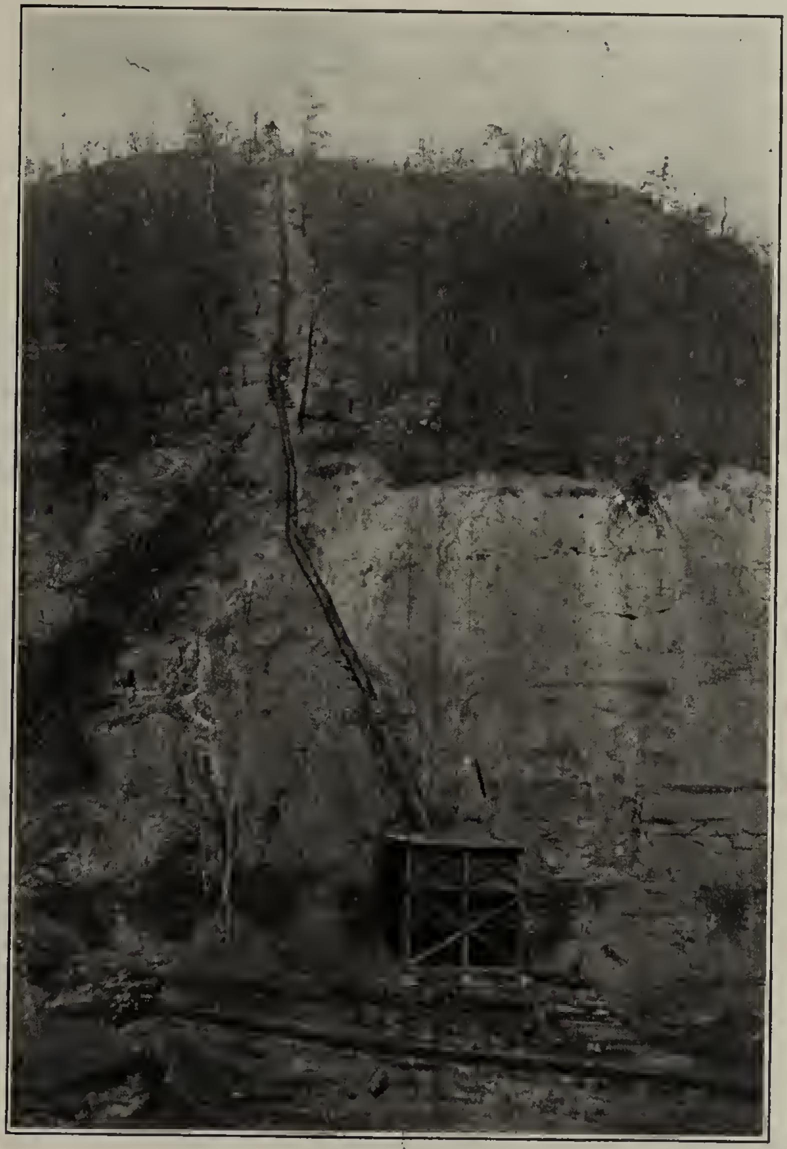
GOOD COST SYSTEM A PRODUCT OF TIME

We have endeavored to outline to you in a brief way what we have found to be a practical method of cost-keeping. The system which we have in use is the result of ten years' study along this line. We have made changes from year to year and we hope to make further improvements from time to time. A good cost system is not built in a day, it must be changed to meet the changing conditions in the business, and should be kept up to date at all times. We are only just beginning to understand the value of a proper system, the advantages to individual plants are innumerable. How much more valuable it could be made if a uniform system could be adopted by all plants and comparison be frequently made.

We would be glad at this time to compare cost with any manufacturer who can see this in the same light as we do. Much good is bound to come to all parties of such an exchange. Not only will glaring faults be pointed out (for we all have them) but the manufacturers will be drawn closer together in the study of their plant problems just as they have been drawn together with sales and promotion problems. The more we know of our friends, their conditions of manufacture, their product, their troubles and their joys, the more interest we will have in them and the more joy and satisfaction we will have in our own work.

Mr. Blair's paper was followed by a very interesting and helpful discussion on the part of prominent members of the industry, regarding the points covered by the speaker.

One of these was the question as to whether or not the proportion of No. 2's manufactured should enter into the cost of making No. 1 brick. W. G. D. Orr of the Purington Paving Brick Company, Galesburg, Ill., contended that, since many manufacturers sold their No. 2's at slightly below cost, this loss in profit should be rightfully charged to the cost of making No. 1's. Others held that it cost as much to make a No. 2 as it did to make a No. 1 and that it was not right to charge up the loss in profits to the cost of making a No. 1 brick.



How a No. 3 Fire-clay Is Transported from the Top of the Hill Where it is Gathered, to the Point Where it is Loaded on Cars for the Plant of the Peebles Brick Company

Another much discussed topic was depreciation. Mr. Blair's paper brought out the fact that his company made a periodic charge covering this item, but it was found that other manufacturers were handling it somewhat differently. One member in particular held that he kept his plant up to a high state of efficiency and repair and therefore there was no depreciation. It looked at first as tho this method of handling the subject had some glaring inconsistencies about it, but upon further discussion it was found that this manufacturer was in reality charging off a fixed amount each month to cover depreciation, altho it was not called by that name.

These and a good many other subjects were brought up, making this meeting very unusual in point of cost discussions, most of which, in other branches of the industry, have been characterized in the past by a lack of knowledge on the subject.

The last speaker of the evening was Clinton H. Scovell of Clinton H. Scovell and Company, Certified Public Accountants, who took up the thread of what had been said before, and, weaving it into a finished fabric, showed the paving-brick manufacturers that what they needed was a uniform cost system which would eliminate confusion as to the items charged and prevent much of the misunderstanding which had marked considerable of the discussion. He pointed out the fact that it is very evident that very few of the manufacturers were keeping their books in the same manner and that, in view of this fact, there was liable to arise considerable inaccuracy which would defeat all attempts at progression along the lines of getting at accurate costs.

It might be mentioned at this point that preceding Mr. Scovell's talk, a motion was passed, calling upon the chair to appoint a committee of five to investigate the cost systems of those manufacturers who are willing that this should be done and report at an early date to the Institute, giving their recommendations as to the course to be pursued. This, it is hoped, will result in the adoption of a uniform cost accounting system among paving-brick manufacturers.

Those who attended the meeting were: C. C. Blair, Paul Kanengeiser, R. C. Wallis and C. L. Weaver, of the Bessemer Limestone Company; W. H. Terwilleger, Purington Paving Brick Company; R. L. Lewis, Athens Brick Company; A. B. Kline, John Kline Brick Company; J. Brennan, Barr Clay Company; S. M. Duty, Medal Paving Brick Company; F. R. Kanengeiser, Bessemer Limestone Company; W. G. D. Orr, Purington Paving Brick Company; P. A. Smith; M. B. Greenough, Case School Applied Science; R. T. Stull, Dunn Wire-Cut-Lug Brick Company; H. A. Ford and F. E. Schultz, Medal Paving Brick Company; N. D. Dodd, Burton-Townsend Company; O. W. Renkert, R. B. Keplinger and S. D. Wonders of the Metropolitan Paving Brick Company; D. C. Wilcox, Alliance Clay Products Company; E. G. Zorn, "Brick and Clay Record"; T. A. Randall, Secretary N. B. M. A.; M. E. Gregory, Brick, Terra Cotta & Tile Company; F. W. Wood, Danville Brick Company; C. H. Scovell, Clinton H. Scovell & Company; A. E. Carlyle, Carlyle Paving Brick Company; David Edwards, Portsmouth Paving Brick Company; R. D. Dupre and Chas. Brocke, Carlyle Paving Brick Company; J. G. Grubbs and Henry Collis, Portsmouth Paving Brick Company; H. B. Murray, Jr., S. C. Peebles, Chas. W. Finney, Chas. M. Stewart, D. A. Moulton and John Peebles of the Peebles Paving Brick Company.

HUMPHREY BIDS FAREWELL *to* CLAYWORKING

On April 1 the clayworking industry lost a valuable member in the resignation of Dwight E. Humphrey, formerly general superintendent of the Deckman-Duty Brick Company of Cleveland, Ohio, having served that company for three years in this connection. F. E. Schultz, who came into the Medal Paving Brick Company which was formed when the plant of the Wooster Shale Brick Company was purchased by the former Deckman-Duty Brick Company, will succeed Mr. Humphrey, who has become associated with the Portage Engineering Company of Akron, Ohio, as its secretary.

The departure of Mr. Humphrey from the clay field and his subsequent association with the Portage Engineering Company was brought about by the fact that Carl Beck of that company has recently been appointed Director of Public Service in Akron, which makes it impossible for him to give his time to the above concern. During 1915 building permits were issued in that city to the amount of $6,130,950—an increase of fifty-two per cent. over 1914. But Akron is still short of houses and homes and new sub-divisions are rapidly developing.

This condition presents a very fortunate situation for the Portage Engineering Company, and incidentally Mr. Humphrey. The company will confine its activities to private street, sewer and sidewalk construction and also to building homes. In this connection, it is anticipated that the number of built-with-brick houses in Akron will show a substantial increase during the next year or two, a condition that will naturally follow the entrance of one who knows the value of burned clay building materials, into the contracting circles of that city.

On Your Right, as the Man on the Sight-Seeing Bus Would Say, We Have Dwight E. Humphrey, Who Has Gone to Seek His Fortune in Pastures New; On the Left, is Carl Beck, Recently Appointed Director of Public Service, Akron, Ohio, Mr. Humphrey's New Associate

The CERAMIC STUDENT'S OPPORTUNITY

How He Can Win a Paid-Up Membership in the American Ceramic Society and Honorable Mention in This Magazine

WITH A VIEW toward stimulating a greater interest in the production of valuable ceramic literature, "Brick and Clay Record" is pleased to announce a competition for the writing of the best paper on a clayworking subject, by the students of each of the ceramic schools in this country.

This contest is open to all students who are enrolled in a course of ceramic engineering in the various universities and colleges. The prizes will consist of the payment of the initiation fee and the first year's dues in the American Ceramic Society, one prize being allotted to each educational institution offering a course in ceramics.

Owing to the fact that nearly everyone has some special topic or division of the industry in which he is particularly interested, no definite subjects are assigned for the papers which are to be submitted in the competition. Of course, the choice of a timely topic and one of wide interest would be an advantage to any of the participants. The editors of this magazine are willing to furnish subjects to any who feel that they would rather have some topic assigned.

Arrangements are being made so that the prizes may be awarded by a committee selected from the membership of the American Ceramic Society. Professor Edward Orton, Jr., secretary of the society, has given his endorsement and hearty support to the competition.

It will be necessary for those students desiring to take part in this contest to so advise those in charge of the ceramic work at the various universities. These professors will file a list of the participants with the editors of this magazine. May 15 has been set as the last day upon which registrations will be received, but the students may begin the preparation of their papers at once. The contest will close on June 15, at which time the papers will be turned over to the committee from the American Ceramic Society, to be graded and the awards made. This will provide an opportunity to the winning candidates from each school to attend the summer session of the society, which nearly always meets in August, between the 10th and the 25th.

Those who are authorized to receive the registrations and papers to be forwarded to the office of this magazine are as follows: For the New York State School of Clayworking and Ceramics, Alfred, N. Y., Professor Chas. F. Binns; Ohio State University, Columbus, Ohio, Professor A. S. Watts; University of Illinois, Urbana, Ill., Professor Ralph Kent Hursh; Iowa State College, Ames, Iowa, Professor Homer F. Staley; Rutgers College, New Brunswick, N. J., Professor Cullen W. Parmalee. If any students from other schools which are offering some limited work in ceramics, desire to take part in this competition, they can signify their intention by registering thru the professor in charge of the work.

It is needless to urge the desirability of the prizes which will be offered. The American Ceramic Society is an organization of high standing and with an enviable record of good work accomplished. Not only will the membership be awarded as above outlined, but the winning papers will be published in the columns of "Brick and Clay Record." It is more than possible that one or more of the papers may find a place in the Transactions of the American Ceramic Society, at the discretion of the society.

All who wish to enter this competition are urged to register at once and start the preparation of their paper. The time is short and too precious to waste in delay.

DETAILS OF THE CONTEST

Who Are Eligible—All Students Enrolled in a Course of Ceramic Engineering at the Various Universities and Colleges in United States and Canada.

How to Participate—Prepare a Paper on a Clayworking Subject and Submit it to "Brick and Clay Record" Thru the Proper Authority.

The Prize—A Membership in the American Ceramic Society, Which Includes the Payment of the Initiation Fees and One Year's Dues. One Prize is Allotted to Each Ceramic School.

ALL REGISTRATIONS MUST BE IN BY MAY 15.
CONTEST CLOSES JUNE 15.

Professor Orton Resigns as Head of Ohio State Ceramic School

Professor Edward Orton, Jr., the founder of the Department of Ceramics of the Ohio State University, Columbus, Ohio, the first of its kind in this country, and father of the American Ceramic Society, has resigned his position as dean of the College of Engineering, which he held at that institution.

The Board of Trustees of the University, at its meeting on March 7, received the resignation of Professor Orton and, after finding there would be no reconsideration of same, reluctantly accepted it, but prevailed upon him to accept the position and duties of a research professorship to occupy a portion of his time only.

The grounds for insisting upon this change in his work, as given out by Professor Orton, were first, the increasing pressure from private business responsibilities and second, a desire for relief from routine teaching and administration in order to devote some portion of his time to scientific and experimental work.

The Department of Ceramic Engineering at the Ohio State University will, in the future, be administered by Arthur S. Watts as head professor, and Carl B. Harrop as assistant professor. Plans are now being made for the addition of another man of professional rank to the teaching staff. Professor Orton, altho no longer serving in an active capacity, will be in the department daily in the execution of his research duties and will probably carry some graduate instruction, so that in personnel, the department will be stronger than ever before.

Equipment is being added constantly and some much needed apparatus for experimental work is now being ordered for installation during the summer months. The attendance of the ceramic classes at the university this year has been very large, about eighty students being enrolled.

Minnesota Architects Draw Plans for Low-cost Brick and Hollow-tile Houses

A movement which is of vital importance, not only to the manufacturers of brick and hollow-tile in the state of Minnesota, but thruout the whole nation, is announced in a recent circular from the Minnesota State Art Commission to the effect that it is to conduct an architectural competition for a dwelling to be built of brick or hollow-tile. The cost of the house is placed at $2,500. The cash prizes which will be awarded to the successful architects will total $650, the competition beginning at once. The entries have already been closed and May 27 has been set as the date upon which all plans must be in the hands of the commission. Only designers who are resident in the state of Minnesota are eligible.

It will be remembered that mention was made of the plans for this competition in the report of the annual meeting of the Northwestern Clay Association which appeared in the February 1 issue of this magazine. It was at this meeting that the association offered its co-operation by providing the prizes for the contest. As a result of action taken at that time, the Minnesota State Art Commission, a department of the state government, has invited architectural designers of the state of Minnesota to submit plans in the competition above mentioned. This movement to provide the citizens of this and other states with plans for a brick or hollow-tile house has grown out of the success of previous competitions for a model farm house and a model village house, both of which were designed in wood.

It is hardly necessary to comment on the inauguration of this competition. Every manufacturer of burned clay building materials realizes the great need of plans such as will result from this contest.

It might be mentioned that the Bricklayers and Stone Masons' Union has a part in providing for the prizes, which are to be divided as follows: The best design will receive $200; the design placed second will receive $175; the design placed third will receive $125 and the next three best designs will receive each $50. There will be six honorable mentions.

Demand for Hollow-tile Improving

Stockholders of the National Fire Proofing Company, Pittsburgh, Pa., were told by President W. D. Henry at the annual meeting held on April 6, that the amount of business transacted so far this year is largely in excess of the same period in 1915. President Henry also said that the oil developments on the company's 3,000 acres of land at Haydenville, Ohio, which it owns outright, looked very promising, and more wells will be drilled. He said that sufficient territory had been proven to permit the company to drill fifty to sixty wells. The consensus of opinion was that the property should be thoroly developed. Statements asked concerning the cause of the company showing a loss for 1915 were answered by Col. John B. Finley, president of the board of directors. He attributed this to a very poor building year. He said there were few companies last year that did not show red ink figures on the ledger. In answer to a question as to when the stock of the company would be listed on the New York exchange, President Henry said the application was in the hands of a committee and that he expected it to be acted on shortly. In compliance with a resolution passed a year ago, that the directors of the company be elected for one, two and three years respectively, the following were nominated and elected: For one year—S. F. Heckert, W. E. Cooke, George A. Jones and J. J. Booth; for two years—D. M. Campbell, J. C. Craig, W. L. Curry and H. M. Koasbey; for three years—J. B. Finley, W. D. Henry, John R. Gregg and E. H. Straub.

"Natco" Employes Receive Raise

An increase of ten per cent in wages was recently granted the fifty-eight employes of the National Fireproofing Company's plant at Port Murray, N. J. This is the second "raise" of a similar amount that has been granted to the employes of this plant within the present year, the other having been made on February 1.

These increases are the direct result of a greatly enlarged volume of business, the like of which has never before been witnessed in the history of the company. The working force at the Port Murray plant will be doubled just as soon as a large shipment of new machinery is received and installed. The plant operated to capacity all thru the past winter for the first time in several years, the ware being shipped as fast as it came from the kilns. Orders on hand at the present time will necessitate running the plant both day and night for several months.

Detroit Brick Prices Make Second Advance

The Detroit (Mich.) Brick Manufacturers and Dealers Association, thru its manager, William B. Wreford, has announced another increase in the price of common-brick, bringing the present price up to $9 per thousand. The reason given is the scarcity of labor and an increased demand for brick. Detroit is enjoying the greatest building "boom" in its history. There never was a time when orders for brick and all kinds of building material were as numerous as they are now. On March 1 the price of common-brick was advanced from $7.50 to $8.50 per thousand, so that the latest increase to $9 makes two advances within sixty days. No assurance is given by local manufacturers that the price will not go higher. On April 1 the brick manufacturers granted an increase in wages to laborers from $1.75 to $2.50 per day, which affected about five hundred men. At the same time the announcement was made that as many more men would be hired as soon as they are available. On account of the prosperity of the city and the heavy demand for laborers in other lines of trade—particularly the automobile industry where higher wages are offered—it has not been an easy task for the brick manufacturers to hold their former employes. It has also operated as a disadvantage in securing additional help.

Robert G. Reese, for twelve years an employe in the Youngstown (Ohio) postoffice, has resigned his connection with "Uncle Sam" to engage in the pottery business at East Liverpool, as one of the officers of the Oakwood China Company.

MIXING BRAINS *with* CLAY

Touched by the Magic Wand of Intelligence, the Plant Herein Described Has Been Made to Produce a Quality Product, Bringing an Attractive Price and Replacing Quantity Production Which Sold for a Comparatively Low Figure. This Story Contains a Wholesome Lesson to All Who Work in Clay

The Knowledge of the Ceramist and Skill of the Jiggerman Combine to Produce a Masterpiece in Burned Clay Art

TO THE LAYMAN there is a great deal of mystery in the fact that the beautiful faience—the handsomely colored fruit and flower bowls, and candle-sticks that adorn the buffets of thousands of American homes—is made of clay—just common clay. The bewilderment increases when it becomes known that the brick of which the home is built, and the drains that lead from the house and which make city living pleasant and safe, are also made of much the same material.

The ordinary citizen cannot understand how the riot of color seen on art pottery, or the antique effect brought about by matt glazes, can be produced from the "dirt" that is often trodden under foot. Nor can he bring his mind to realize that the seemingly humble brick—a half of which in youth he

The Pit at the Re-made Pottery Plant, That Has Not Been Worked for More Than a Year

A View of the Pottery Looking Toward the North Where the Vestige of a Comparatively Unprofitable Drain-tile Business May Be Seen

often threw at a stray dog or thru the window of a vacant house—is really a brother of the beautifully colored tray upon which he now places his card when making an afternoon call.

To the man behind the scenes—the potter or clay products manufacturer who has been thru the long and tedious processes of making this ware—there is no mystery at all. The vase which he hands the buyer of a large city retail establishment is the product of hard work plus brains.

There is nothing to prevent the ordinary citizen from making his own pottery so far as the availability of materials is concerned. But he cannot. Why? Because he does not have the knowledge of how to handle the clay or mix the glazes to produce the ware for which he pays a high price at a local department store. Therefore the mystery.

The manufacturer of burned clay building materials may well place himself in the position of the common people, to use a newspaper expression, as regards the manufacture of faience and fancy pottery. The average clayworker aims at quantity rather than quality production, and strains every nerve and muscle to pile up a big tonnage which is sold at a low price, rather than putting more thought into the making of a better product to be sold at a higher price. There is too much of the "bigga da mus'" in the management of most clay plants and too little application of "gray matter." That is why many brick and tilemakers look upon the manufacture of pottery as a separate industry—one in which there is much of the mystical.

A very interesting example of how an unprofitable business was made highly remunerative, turning from a strife-filled market to one of little competition and good prices, has come to light recently. This regeneration of a clay plant, the story of which follows, contains a wholesome lesson for many clay products manufacturers. It shows what can be done by mixing brains with clay. Not that you, as a reader, can or are expected to follow in the footsteps of the manufacturer, reference to whose plant is made herein. That would be folly, as you will agree as you read. Perhaps not one in a thousand could do the same thing. It requires two years of heavy outlay to launch a pottery business, and then it is not always successful. For instance, a million dollar concern, not in the clay business, started a pottery in Kentucky not so very long ago, but could not "swing" it.

Rather let this story be an inspiration for the making of a better brick or tile than is now being made at your plant, which will have for its chief asset—quality—and which will bring a higher price in return for the added thought put into it.

Changing over from the manufacture of drain-tile and common building brick to the making of fine pottery, using the same clay for the bisque ware, is an occurrence that is, to say the least, unusual. Yet this very thing has taken place and the enterprise is progressing with unqualified success. A striking example of what a small part quantity production plays in the operation of this interesting plant, is seen in the fact that the pit—which contains a surface clay—has not been worked for more than a year. The stock of clay which was in storage when the plant "changed over" is being used now in the manufacture of the new ware. This stock was not unusually large and would have been consumed long since in the manufacture of common-brick or drain-tile. About as much clay is used in a month as was formerly consumed in a day.

As has already been mentioned, a surface clay is being used, of which there are two kinds—one a red-burning and the other a blue-burning clay. A mixture of both is run into a blunger and then over a three thousand mesh screen, this operation requiring two hours. The liquid is then led into a brick cistern fifteen feet deep and eight feet in diameter, from which it is pumped into the filter press where the surplus water is removed.

After spending two hours in the press, the clay is removed and pugged in an old brick machine which was part of the

The Casting Department Where the Oval and Rectangular Pieces Are Made equipment when common-brick were made at this plant. After being pugged the clay is placed upon trucks and taken on an elevator to the fourth floor of the plant building where the mold, jigger and casting departments are to be found, and where the drying room is also located.

When this plant first undertook to make pottery, some difficulty was experienced in drying, cracking and warping being the chief sources of trouble. However, after some experimentation, these difficulties were soon eliminated by the introduction of a small quantity of a more plastic clay than found on the property. Weathering the clay also helped to make it less troublesome.

No special form of drier is used, the ware being placed on pallets which rest upon racks in the same room where it is shaped. In winter, the steam heat that is necessary to make this floor a comfortable workshop, is sufficient to dry the ware, and in summer nature is the sole drying agent. Two days is the usual period required for drying the ware after which it is set in the bisque kilns, two of the old kilns, formerly used for burning drain-tile and brick, being used for this purpose, the ware, of course, being placed in saggers. About a week is required for burning the bisque ware, following which, it is removed from the kilns and placed in a stock room to be drawn upon as needed by the glazing department.

When the product was changed at this plant, only one glost kiln was built. It was believed that this would be sufficient to take care of the company's business for a while at least, but because of the pressure of orders now existing, plans are being considered for the immediate construction of another glost kiln to expedite deliveries. About two days are consumed in burning the ware after it has been glazed. It is interesting to note that the only difference in the burning time, and, therefore, its cost, between the ware now manufactured and that formerly produced, is the two days consumed by the glost kiln, the bisque ware being burned in about the same time as was formerly the brick and drain-tile. This added expense in burning is very small compared to the present high prices received for the ware.

It might be mentioned that this plant is now producing about three hundred shapes, all of which are classed as specialties. In addition to this, from thirty to forty different glazes and combinations are used. The ware is sold all over the country by retailers of high standing.

In order to attain success in this enterprise, it was necessary to employ a ceramist-superintendent with a highly technical training, including foreign schools and wide experience. But this was not all. After the new superintendent arrived "on the job," it required six months of experiment and study, with its accompanying expense, before a piece of ware was manufactured for sale. It is safe to say that, without the brains that have and are being applied in the management of this particular enterprise, it would be a dismal failure.

With very few exceptions, there is plenty of room for improvement on the clayworking plants of this nation. In far too many cases, it is price that takes the order instead of quality.

The average buyer of clay products is susceptible to the quality argument if the salesman is man enough to present his case convincingly. Not only can quality be made to land the order in competition with an inferior product, but it nearly always is the means of bringing a higher price.

The production of a quality product means a larger investment of time and thought in the manufacturing processes of the business. It means a careful study of market conditions and careful, patient experiment to produce the desired effect or shape of ware, but—

It is the price that pays in the end. It is the investment that is bound to bring rich returns in the minimizing of competition and increased profits. The directions are simple but hard to follow—*Mix Brains with Your Clay.*

Drawing a Bisque Kiln Which Was Formerly Used for Burning Common-Brick

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Congressional Library Wants Back Copies

In order to make its files complete, the Library of Congress, Periodical Division, Washington, D. C., is desirous of securing the following issues of "Brick and Clay Record": January 5, March 16, May 18, June 15, July 6, September 7, October 19, November 2, for the year 1915 and the issues of January 4, January 18 and February 15 of the year 1916. The stock of these issues on hand in the office of this magazine have long since been exhausted.

If you have any or all of these numbers and are willing to part with them, the Librarian will appreciate a letter from you to this effect.

The Library of Congress is probably the most complete and comprehensive collection of literature and data in the United States, and is used to a large extent by members of Congress for reports and in the drafting of bills to be presented before that body. Clay products manufacturers should be interested in seeing that this library has a complete file of "Brick and Clay Record."

"The Purington News" is the name of a new publication issued monthly by the Purington Paving Brick Company of Galesburg, Ill.—a feature that was born with the recent opening of the plant. The activities of the six hundred men employed on the plant are sufficient in number and variety to make the sheet extremely interesting. The paper is giving the employes an opportunity to keep in touch with what is going on at the plant and serves as a medium for the presentation of information that will make a more efficient working force.

THE DESIGN *and* CONSTRUCTION *of* CONTINUOUS KILNS

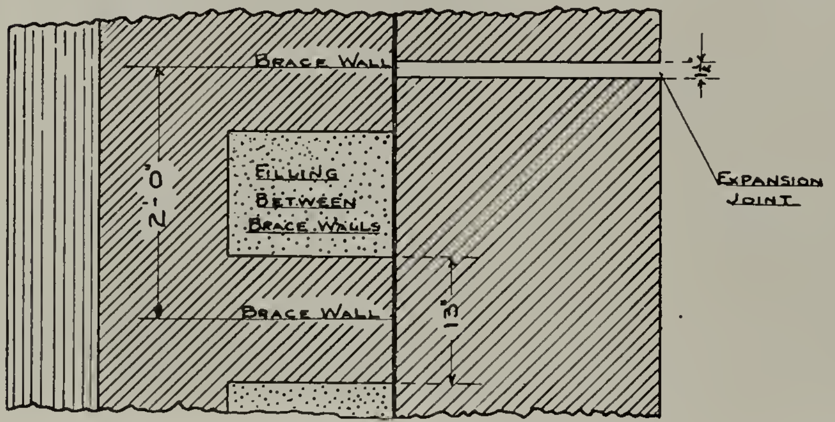
Some Clarifying Notes on a Much Misunderstood Piece of Clay Plant Equipment Which Had Its Origin in Europe

By A. F. Greaves-Walker

Author of "The Design and Construction of Down Draft Kilns," "Setting Down Draft Kilns," "Running a Plant to Capacity" and "Dies for Hollow Ware."

(*Continued from April 4 issue*)

IT HAS BECOME the general practice to provide continuous kilns with roofs. These roofs very naturally shed a great deal of water during wet weather and, in the great majority of cases, no troughs or down-spouts are provided to carry away this water. To allow it to soak into the ground around the kiln is an exceedingly bad practice. The damage done in this way in a single year will pay for properly troughing the kiln roof several times over. When a proper drainage system is provided for the kiln bottom, the roof water can be led into the main drain and thus be carried away.



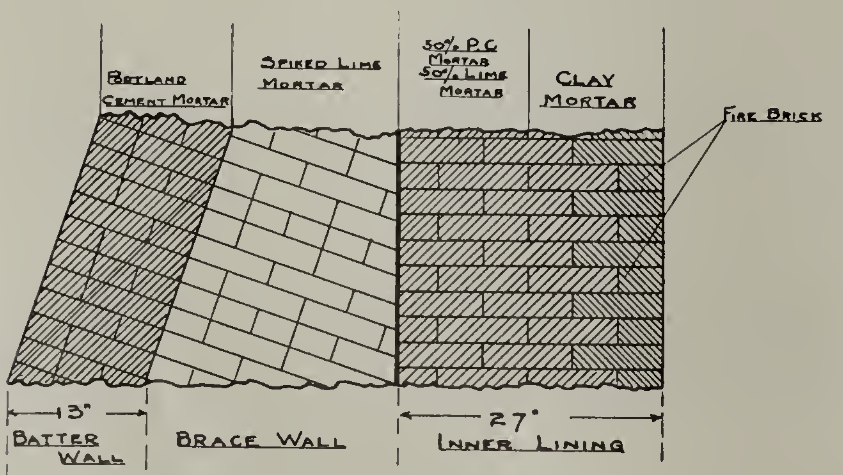


Fig. 5 Section of Wall

Providing proper drainage is an expensive proposition, but the clayworker who is not prepared to go to such an expense would do well to stay away from continuous kilns until he is willing to make the expenditure. Nothing but regret has followed, and will follow, every attempt to "get by" without paying the price.

SIDE WALL CONSTRUCTION FOR TUNNEL KILNS

Two types of exterior walls are used in continuous kiln construction—the straight, buckstayed type like those of the ordinary rectangular kiln, and the battered type, with which no buckstays are used. There is practically no difference in cost, the additional thickness of the batter wall being about counterbalanced by the iron work of the straight wall. One decided advantage the straight wall has is the saving of yard room. It also has a far better appearance. The batter wall provides better insulation on account of its thickness, but there is no reason why the straight wall cannot be provided with four or more inches of insulating brick. Consideration should be given to the fact that with the thick walls the transfer men and wheelers must travel further. This takes time and is a fixed charge as long as the kiln lasts.

In deciding the construction to be used on the various walls, the type of kiln and the location of the wall must be carefully considered.

It is customary to build the side walls of a tunnel kiln with a one-in-three batter on the outer or exposed side, while the inner sides are vertical. In the past many kilns have been built with the outer and inner walls entirely separate, the space between being filled with clay, cinders, sand or rubbish. A large number of such kilns have become inefficient and some of them more or less complete wrecks on account of a lack of knowledge on the part of the builder, or poor workmanship.

The fact that the outer and inner walls expanded differently on account of the difference in temperature was also entirely overlooked, with the result that the brace walls were tied to both. These were quickly torn to pieces, leaving nothing but a lot of loosely packed rubbish to keep the walls at the proper distance and the crown of the tunnel in place. Moreover, the loose filling worked its way into the inner walls of the tunnel and quickly destroyed them. Kiln after kiln has either partially or entirely collapsed on this account with consequent condemnation of the continuous kiln.

The brace wall type of construction is to be condemned if for no other reason than it has been proven that in the vast majority of cases *not enough care will be taken to make a perfect job.* Another and very good reason is that when sufficient care is taken to make a good job, the cost will almost equal that for solid brick walls. As the principal idea of the heavy wall is insulation, *a thinner and stronger wall can be built solid, with an inner lining of insulating brick* that will not only give better results so far as insulation is concerned, but will give better burns, longer life, *and will cost less.*

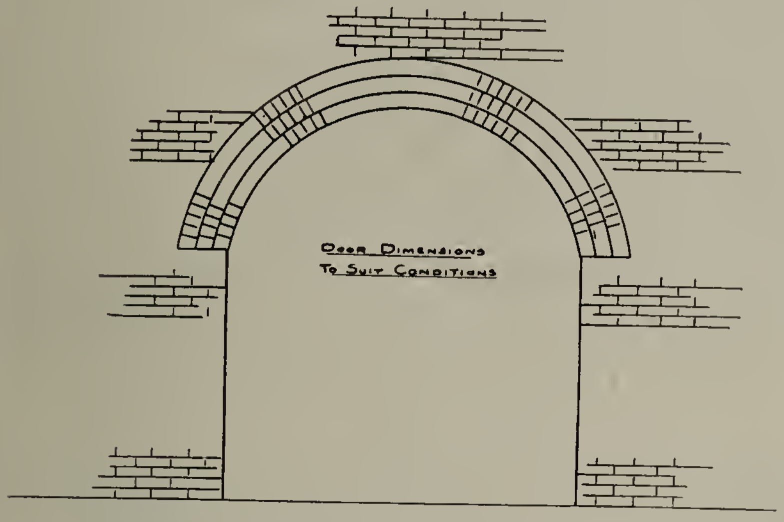


Fig. 6 – Door Construction

As "filled" walls will continue to be built, it is deemed wise to describe the best method of construction which is shown in Fig. 5.

The outside or batter wall should be thirteen inches thick, with mortar joints at right angles to the face. It is not necessary to put in header courses closer than every fourth course. All brick should be hard and the mortar should be a mixture of three parts sharp, clean sand to one part Portland cement. To this may be added ten per cent. of lime putty to improve its troweling qualities. *Lime mortar should not be used under any circumstances* because the kiln will in all probability be under fire and subject to expansion strains before the mortar could reach its maximum strength, or anywhere near it. The inner or tunnel walls proper should be not less than twenty-seven inches thick and should be laid up with *alternate header and stretcher courses thruout.* No other bond should be used under any circumstances, for it must be remembered that these walls are continually "rolling" forward and backward thru expansion as the fire passes around the kiln. The inner side of the tunnel wall should be lined with brick of a refractoriness suitable to the material to be burned. *This lining should never be of common-brick.*

FIRE BRICK LINING ECONOMICAL IN LONG RUN

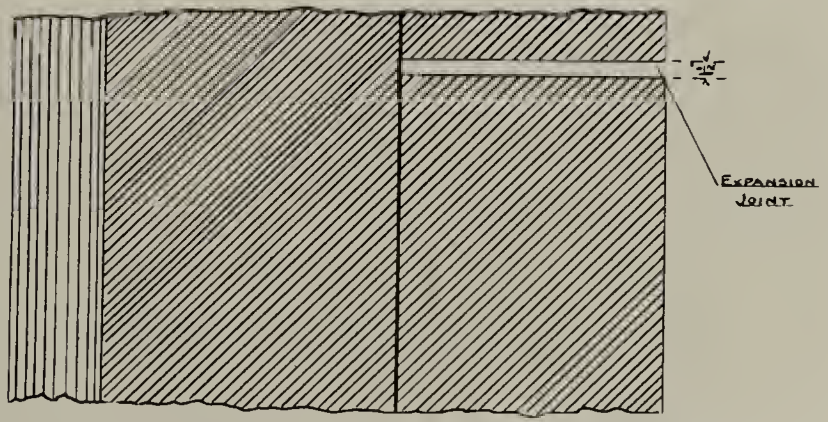
It is hard to estimate the amount of money that has been lost in the attempt to "save" a small amount on the lining by the use of common-brick. If low temperatures only are to be used, a cheap stiff-mud fire-brick will fill all requirements. If higher temperatures are to be attained, a better grade of brick must be put in. Seldom is it necessary or wise to use a high grade fire-brick for this work, unless the kiln is used for refractories. Second or third quality brick are sufficiently refractory in ninety-nine out of one hundred cases. Being dense and strong, they are much better suited to this class of work. In cases where only ordinary heats are used, the stretcher courses need only be faced with four inches of fire-brick. Back of the fire-brick, only first class hard brick should be used. The use of "bats" and soft culls in these particular walls is a great mistake.

The brick (both refractory and common) on the inner half or thirteen and one-half inches of the walls should be laid up in fire-clay, or fire-clay and shale dust. The horizontal joints should be as thin as it is possible to make them with a trowel and mallet. The vertical joints should be about one-fourth inch wide. These joints are made wider to allow for the horizontal expansion of the kiln. After burning, each joint will shrink about ten per cent. of its green width, and thus thousands of minute expansion joints are provided in the length of the kiln. The outside thirteen and one-half inches of this wall should be laid up in a mixture made of fifty per cent. three-to-one Portland cement mortar and fifty per cent. three-to-one lime mortar. This mixture has been found to give excellent results where both Portland cement and lime mortars have failed. A lime mortar would do the work if it really had a chance to harden before being subjected to heat. A clay mortar does not get sufficient heat in the outside half of the wall, to harden. It merely dries out and loses its bonding qualities.

Expansion joints one and one-half inches wide should be left in the tunnel walls every twenty feet. *These should always be made to come in the center of one of the brace walls* which extend from the outside walls.

HOW BRACE WALLS SHOULD BE BUILT

Brace walls should be built between the batter walls and the tunnel walls on two-foot centers. These brace walls should be thirteen inches thick and tied to the batter walls, being bonded perfectly with them and the mortar joints continuing in the same direction. *These walls should not be tied to the tunnel walls.* If they are, they will be quickly torn to pieces by the expansion of those walls. However, they should be built solidly against the tunnel walls, for it must be remembered that they take the place of the irons on a rectangular down-draft kiln. They not only keep the tunnel walls in place but take the thrust of the crown. It is for



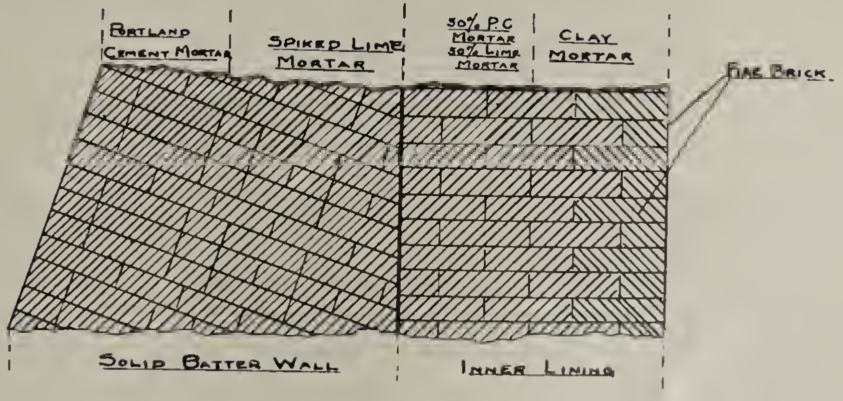


Fig. 7 – Section of Solid Wall

this reason that they must be built close together, if a long-lived kiln is to result.

Between the batter and the tunnel walls the spaces are filled with ground clay or a mixture of ground clay and sand. *This filling should be done as the walls rise*, but not before the brickwork is sufficiently strong to allow it to be *tamped lightly* to insure its being solid.

Shale or clay which has been put thru a dry pan or other grinder makes the very best filler. It should be just damp enough to form a ball when squeezed in the hand. The great advantage of such a filler is that it will harden to a solid mass and will not work into every crack in the brickwork and thus tear the kiln to pieces.

Words cannot be found that are strong enough to condemn the common practice of finishing up the walls and crowns and then dumping into the spaces, the excavation from the kiln bottom, "bats," rubbish and anything else that is handy or in the way. So-called kiln builders are often responsible for such jobs and the clayworker only allows it because of ignorance and inexperience.

Door walls should be thirteen inches thick and should be well tied to both batter and tunnel walls. A triple rowlock should be used in the door arches, which are shown in Fig. 6. Too much care cannot be used in the construction of the door walls and, even under the best of conditions, considerable attention must be given to them to keep them in good condition, especially where they tie into the tunnel walls.

SOLID BRICK BETTER THAN CLAY FILLING

A great improvement in the above described kiln construction is the replacing of the clay filling between the batter and tunnel walls with *solid brick* as shown in Fig. 7. There is very little difference in cost, especially if No. 2 brick are available, as is often the case. Absolutely no difference should be made in the construction of the batter and tunnel walls, but the brace walls are left out and what might be termed a continuous brace wall is built in their stead.

The inner section of the wall is a continuation of the batter wall, the bond being continued thru the entire thickness. It should be built solidly against the tunnel wall *but not tied to it*, the latter being left free to move back and forth. Only the outside thirteen inches of the batter wall need be laid up in cement mortar, the balance being laid in lime-cement or "spiked" mortar. Great care must be taken to have all brick laid in *full mortar joints*. Laying the brick in courses and then slushing the mortar over the brick so as to fill the joints *will not do in continuous kiln construction*. Close, neat bricklaying should be insisted on and, instead of filling up wide joints or cavities with mortar, brick chips should be used. The use of "bats" in a thick wall is not to be condemned, providing it is not overdone. A course of "bats" *laid with the same care as is given whole brick*, and not used merely as a "filler" for a few hods of mortar, can be used quite frequently if they are *always tied top and bottom with whole brick*. To use course after course of "bats," as is often done, produces only poor results.

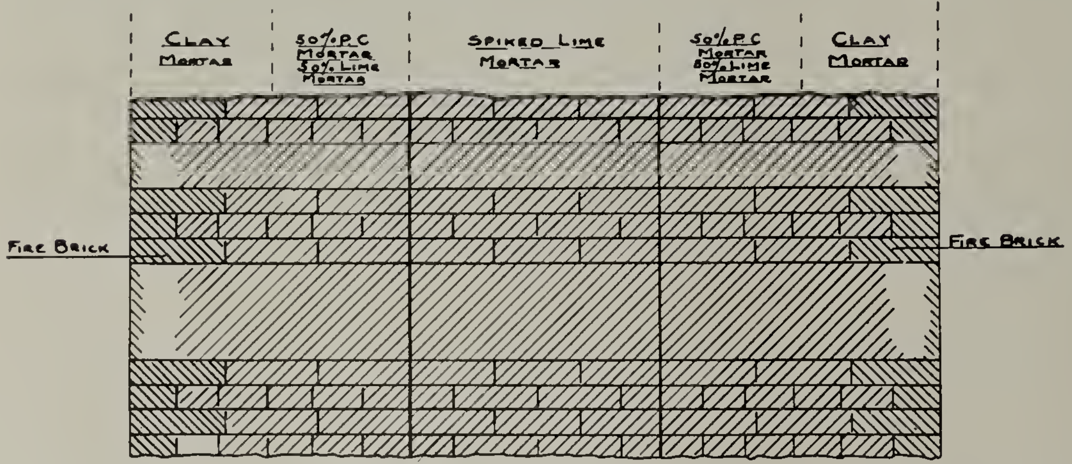

Clay Mortar
50% P.C Mortar 50% Lime Mortar
Spiked Lime Mortar
50% P.C Mortar 50% Lime Mortar
Clay Mortar
Fire Brick
Fire Brick

Fig. 8 – Section Thru Inside Wall Double Tunnel Construction

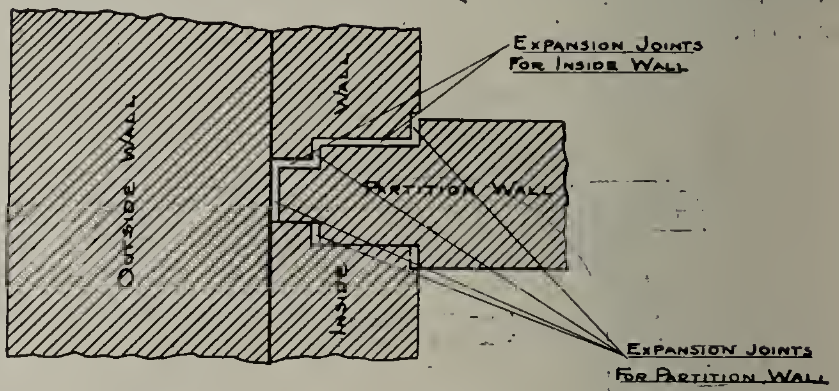

Expansion Joints For Inside Wall
Outside Wall
Inside Wall
Partition Wall
Expansion Joints For Partition Wall

Fig 9 – Detail of Expansion Joints For Chamber Kiln

Where the double tunnel construction is used (two tunnels side by side) the filling between the tunnel walls should always be of solid brick. Each tunnel wall should be built *separately*, with the brick filling between independent of them, as shown in Fig. 8. *To tie these walls together will wreck any kiln very quickly.*

Both straight buckstayed and battered walls are used in the construction of the side walls of a chamber kiln. When battered walls are specified, the construction should be carried out in exactly the same way as described for the tunnel kiln. The expansion joints should be located at the points where the cross walls which separate the chambers and set into the side walls, as shown in Fig. 9. The same construction is used in straight wall kilns.

When straight walls are to be used, several important factors should be borne in mind. Primarily, the thin straight wall is built to conserve yard room. If, therefore, such a wall is made very heavy, it defeats this purpose. On the other hand, one of the great advantages claimed for the continuous kiln is low radiation losses due to proper insulation. A thin brick wall is not a good insulator and the matter, therefore, resolves itself into a question as to whether the clayworker will build a thin, uninsulated wall and put up with a constant radiation loss; a thin insulated wall, which will give him yard room and practically prevent radiation losses; or abandon the idea of the straight wall and build the battered one.

Considered from every possible viewpoint—appearance, space, working conditions and rapidity of construction—the thin insulated wall is the best for the side walls of the chamber kiln. It must be remembered that this type of wall requires the utmost care in construction. Straight walls should never be less than thirty-six inches thick. Instead of building the inner wall separate from the outer, as in the tunnel kiln, the entire wall is tied together as in the case of a rectangular down-draft, *with alternate courses of stretchers and headers*. See Fig. 10.

The header courses should be continued thru the entire thickness of the wall. In the selection of fire-brick for the inner lining, the same rules regarding thickness and quality should apply as in the case of a tunnel kiln, described above. The inner thirteen and one-half inches of the wall should be laid up in fire-clay or fire-clay and shale, the outside thirteen and one-half inches in three-to-one Portland cement mortar with ten per cent. lime putty added, while the inner nine inches may be laid in 50-50 lime-cement mortar. The fire-clay should be laid exactly as described for the tunnel kiln.

Insulating brick should be used as the insulator. Four and one-half inches of this material would be sufficient, but in order to get a perfect bond, it is necessary to use four and one-half inches on the stretcher courses and nine inches on the header courses. They should be laid up as shown in Fig. 10, as they are not as strong as building brick and this construction is stronger than a straight bond.

The use of insulating brick in kiln construction is still novel to American clayworkers. There is some reason (altho very little) why a man who is building a down-draft kiln costing from $2,000 to $4,000 should decide against their use.

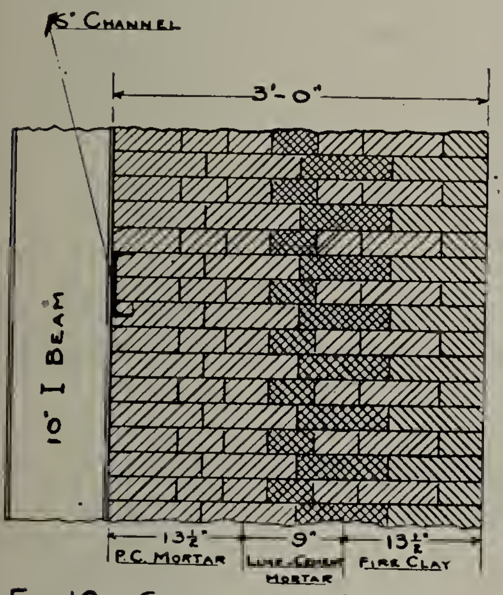
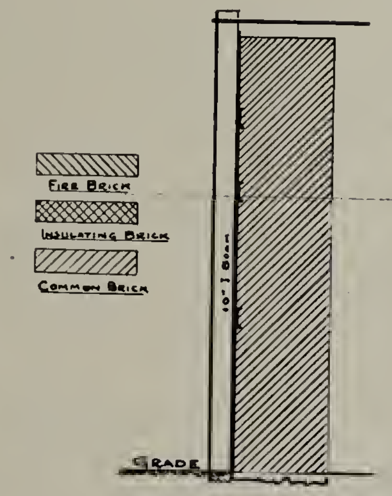


Fig. 10 - Section of Straight Wall Kiln



Section Showing Iron Work

He may expect to be out of business in a few years—and possibly will be, if the balance of his plant is wasting as much money for him as his uninsulated kilns—or he may simply regard the down-drafts as a "hold over" until he can afford to build a continuous kiln. However, for the man who makes up his mind to spend from $25,000 to $100,000 on a continuous kiln, there is not the slightest excuse for overlooking this elementary principal of heat engine construction. A moment's consideration of the fact that *four inches* of this material is equal to from *thirty-two to forty-eight inches* and *nine inches* equal to from *seventy-two* to *one hundred and eight inches* of common-brick work, insofar as insulating qualities are concerned, should be enough to convince any man of intelligence that its use is absolutely necessary. It would be by all means advisable for the man who will not consider the use of this material, to abandon all thought of a straight wall and use the battered wall instead for, in the latter case, the design in itself will give him the insulation which is absolutely necessary for perfect results.

It must be admitted that the insulating brick, which are at present on the American market, have very little strength and, for this reason, some clayworkers, who have investigated them, have been afraid to use them. It is not at all necessary for a clay plant owner to go into the market when requiring a brick of this kind. Almost anyone can make a good insulating brick on his own plant. The principal ingredient of the standard insulating brick is a diatomaceous earth known as "kieselguhr." This material can be obtained in the raw state and any particular quantity of it mixed with any plastic clay and burned. Naturally the greater the quantity of kieselguhr used, the weaker will be the brick, as it is a non-plastic substance, but the greater will be its insulating value. However, almost any good plastic clay or shale will carry fifty per cent. or more of this material and still be as strong as many brick considered strong enough for kiln work. Another and cheaper method of making a fairly good insulating brick is to make a mixture of fifty per cent sawdust and fifty per cent clay or shale and burn it to a fair hardness. The burning out of the sawdust leaves a porous body that makes a good insulating brick of fair strength. Of course, each brick would not have the insulating value of standard insulating brick, but where they are used, the thickness of the insulating wall could be increased in proportion.

Ten-inch "I" beams should be used as buckstays in the construction of a straight wall chamber kiln. These should be spaced ten feet on centers for satisfactory results. The beams should be tied together at the top with one-and-one-half-inch rods having a turnbuckle in the center. The beams should be set in heavy concrete footings to a depth of at least three feet. Tying the beams to the bottom of the kiln walls by means of a ring bolt and a plate buried in the masonry, and eliminating the footings, as has been done on some American kilns, is *utterly useless.* It is simply fastening them to the wall they are supposed to hold in place.

Six-inch channels should be built into the face of the wall, flat side out, at the height of the door arch skewbacks, and extending from door opening to door opening. One channel of the same size should be run the full length of the kiln just above the door arch, and another half way between it and the top of the kiln. See Fig. 10.

END WALLS OF TUNNEL AND CHAMBER KILNS

American practice is fast getting away from the original method of building circular or oval kilns with the chambers or tunnel running completely around the structure, on account of the inaccessibility of the end chambers. The setting of such kilns often offers no particular difficulty, but when the ware is to be loaded on cars, it means costly wheeling. The newer types are the double battery, single battery, or double tunnel single battery. In these kilns the "cross over" is made thru flues from one tunnel to another or one battery to another.

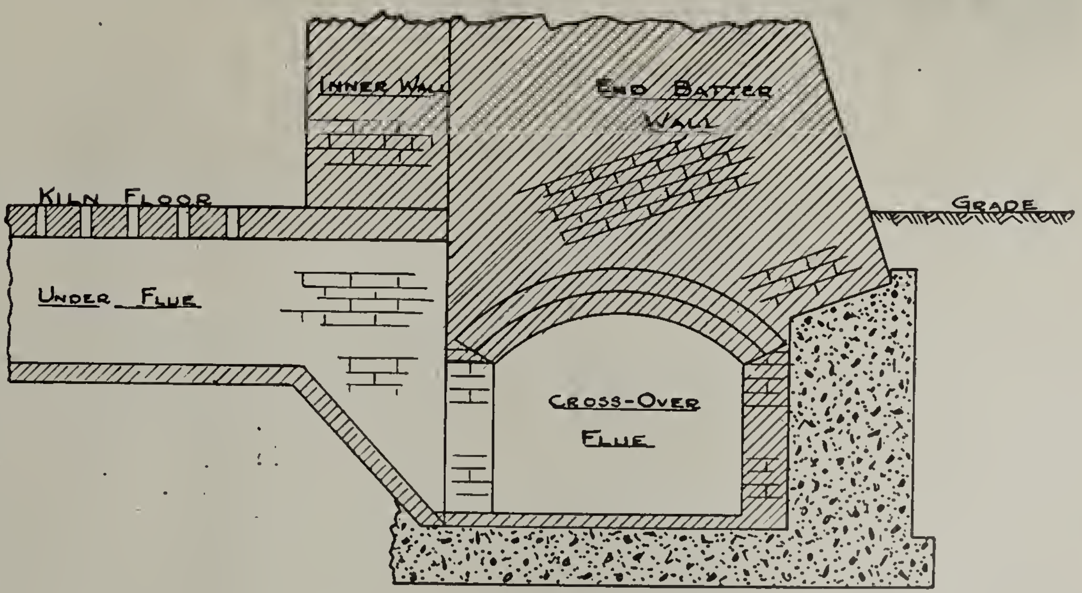


Fig. 11 - Section of End Batter Wall Showing Cross-Over Flue

In the circular type there is often considerable trouble thru the end chambers or tunnels being compelled to take the expansion thrust of the entire kiln. When kilns are constructed in this manner the outside end walls must be built considerably thicker than the side batter walls, with special attention being given to that part of the wall which is to take the thrust of the floor and the crown. The batter should be the same as for the side walls, and the space between the lining and the outside wall should *always be of solid brick,* with the mortar joints continuing those of the batter wall right thru to the lining. In other words, a solid batter wall should be built from outside to lining. The lining should be built as in the side walls and of the same thickness, for in this part of the kiln also, the lining must be free to expand separately.

In the case of the newer types, the end walls are always battered and are built straight across the end. This construction gives far greater stability than the circular end, and is much easier to hold in place. It must always be borne in mind that these end walls take an enormous thrust. Even small kilns are 150 feet long and some of the larger ones several hundred feet in length. The expansion of such a mass of brickwork will quickly wreck any but the best construction. In the case of the chamber kiln, where the chambers and crowns run at right angles to the side walls, the whole thrust of from eight to twenty crowns must be taken entirely on the ends, and any accident to these walls would mean the collapse of the crowns, like a house of cards. Examination of several kilns in which occasional brace walls and earth filling were used between the end batter walls and the lining, instead of solid brick, has shown that the thrust of a kiln is great enough to crush the mortar joints from between the brick, and in some cases, even the brick themselves were crushed to fragments. In each case, this happened in less than five years after the kilns were built.

The "cross-over" flues or those used to carry the heat from one tunnel to another, or one battery of chambers to another, are sometimes built within the end walls. Whenever a flue is to be built within these walls, it should be built so that the *top of the arch comes entirely below the floor level.* It will be seen that to build such flues where they will have to take some of the expansion thrust, is to invite disaster; in fact, practice has shown this to be the case. Fig. 11 shows the proper construction.

(*To be continued*)

Huge Throng Sees Brick Exhibit at Dayton

One hundred thousand people, or thereabouts, witnessed the exhibit of the Crume Brick Company, Dayton, Ohio, shown in the accompanying illustration, which had a place in the Industrial Exhibit held recently in that city. This exhibition extended over a period of eight days and served as a graphic illustration of the industrial progress in the home of the cash register.

The Combination Burned Clay, Rough-textured Face-brick and Sand-Lime Brick Exhibit of the Cume Brick Company at the Recent Dayton Industrial Exhibit

Not only was the product of the Crume Brick Company, which is a sand-lime brick, shown in the exhibit, but several panels of rough-textured face-brick were added as an additional attraction. The last mentioned product is manufactured by the Hydraulic-Press Brick Company, whose lines are handled by the Crume Company in Dayton.

The exhibit was held in the new Delco Building, one of Dayton's recently constructed skyscrapers, and it is interesting to note that a large amount of both products shown in the panels was used in the construction of this building.

The Crume Brick Company is sold up to capacity. The plant has been operated continuously during the past winter but has not been able to accumulate a stock, the brick being shipped as fast as they were made. An increase in capacity of from six to fifteen million brick a year is now being planned, to take care of the increasing demand for this company's product.

Sand Lime Brick Increase in Value

There were 179,643,000 sand-lime brick valued at $1,135,104 manufactured in the United States during 1915, according to the report of the Geological Survey. This is an increase of 7,140.000 brick, or four per cent. in quantity, and $76,592, or seven per cent., in value over 1914.

Michigan was the leading state in the manufacture of sand-lime brick, reporting a quantity marketed to the value of $286,948 or more than one-fourth of the quantity and value of the sand-lime brick sold in the United States. Minnesota was second and New York third. The sand-lime brick industry, after traveling the difficult road of a new industry, reports that it has become firmly established and has found "its place in the sun." Many plant owners are reporting a proposed increase in capacity in anticipation of a large business during 1916.

"Pave With Brick"—Detroit's Slogan

Within the city limits of Detroit, Mich., famed for its brick as well as automobile production, the dominant paving material is brick. Of the 490 miles of paving within the limits of this progressive and rapidly growing city, 137 miles are brick. This figure is exclusive of the "pavers" used by the city traction company between its rails. This figure would amount to about 560,000 square yards.

A tribute to the durability of brick as a permanent paving material was recently given by the officials of Detroit when, after two years of service on the part of a competitive material on one of the streets which receives a heavy traffic, this material was removed and the street repaved with brick. It is interesting to note that before this particular street was paved with the short-lived material, it had been covered by a brick pavement that lasted for a great many years.

Wm. G. Scammell, vice-president of the Maddock Pottery Company, Trenton, N. J., recently addressed the Trenton Rotary Club on the manufacture of pottery, taking for his subject "He Who Breaks Most, Serves Us Best." Figure it out!

IOWA FILLS *a* NEED

State College Offers Practical Courses to Develop Ambitious Young Masons Into Contractors

By Homer F. Staley, A. B.
Associate Professor of Ceramic Engineering, Iowa State College, Ames

IN A BRILLIANT ADDRESS delivered before the annual meeting of the Iowa Clay Products Manufacturers' Association, held at the Iowa State College at Ames, in February, Dr. G. C. Mars of the Hydraulic-Press Brick Company laid emphasis on the fact that the use of clay products is hindered by a dearth of contractors who know how and are willing to use these materials. As a result of this address, the association passed a resolution requesting the officials of Iowa State College to offer such courses as would fit men to become mason contractors.

It must be understood that while we speak of mason contractors we do not mean contractors who do masonry work alone, but instead, general contractors who are competent to take charge of the entire construction of a building, including both the masonry and carpentry work. In too many cases, especially in small towns, masonry work is done by sub-contractors who know very little about the construction of a building as a whole, and the general contractors are really carpenter-contractors who know little about masonry construction. The mason-contractors are not competent to undertake the construction of a complete house and the carpenter-contractors avoid, as much as possible, the use of masonry. Courses of instruction intended to correct this condition must teach the mason-contractor a lot about frame construction, and the carpenter-contractor considerable about masonry construction. We are interested in increasing the number of men who are general contractors in the true sense of the term, and who favor the use of clay products where this is desirable.

On taking up this matter with the members of the faculty who have charge of this class of work, it was found that they are already offering some work along this line and are willing to offer more. The work to be offered is divided into three classes. (1) A two year college course. (2) Short courses of one week at various towns in Iowa. (3) Correspondence courses.

The Iowa State College now offers a course for those who are interested in building contracting and building trades which may be completed in two years.

The development of the building industries has been so great in the past few years that specially trained men are constantly in demand. It is difficult for the ordinary person to familiarize himself with the technicalities of building construction, unless an opportunity for education along these lines is available. Heretofore, such opportunities have been lacking. Those who are already engaged in the building industries will realize that special skill and knowledge are required for the successful carrying on of their work. Many of the practical builders would have appreciated an opportunity to learn the more difficult parts of their vocation in a school and would have been glad to spend at least two years in learning them.

The purpose of this course is to furnish a practical education to the ambitious young man who is interested in the building trades. It is the constant aim to emphasize the practical aspects of the work. It is intended that no time shall be wasted. Subjects that are entirely theoretical are omitted.

The student is first given an elementary course in physics and one in chemistry, in order that he may appreciate the work which follows. Special emphasis is given to the subject of mechanics, heat and electricity, and in chemistry the emphasis is placed upon the chemistry of the industries, including building materials. Mathematics is studied thruout the entire two years and practical work in arithmetic and estimating for building construction is included. A special course in the principles of building construction and the writing of specifications, including not only carpentry but also masonry and brick building, is given in the second half of the first year. The work in drawing continues thruout the entire course, special emphasis being placed upon correct methods of building construction, both frame and masonry. A practical course in cement products, including the properties and use of cement, is given in the third semester. The strength of materials of construction is thoroly studied, and this is followed by a study of the elements of structures.

Engineering Building, Iowa State College, Where a Practical Education in the Use of Burned Clay Building Materials Can be Had by the Ambitious Tradesman

The student who completes this course should be able to enter the employ of an architect as an architect's draftsman, or to find employment with a building contractor and ultimately enter the contracting "game" himself, after he has had the required practical experience. This course offers a unique opportunity in the building field and many young men of the state of Iowa and adjoining states will, undoubtedly, make use of its advantages.

Any student who is seventeen years old and has completed the eighth grade of the common school will be admitted. Graduates of accredited high schools are not eligible.

The cost of a year's schooling at Ames will average about $350, altho, by practicing strict economy, a student may be able to get thru on less. Many students find work and thus support themselves wholly or in part while attending school.

SHORT COURSE FOR CONTRACTORS

The Engineering Extension Department of Iowa State College is planning a short course for contractors to be given next fall and winter in various towns of the state. In the minds of most men the term "short course" is connected with ideas of county fairs and corn judging contests. It is usually supposed to consist of a series of lectures more or less interesting and instructive after which the instructor "folds up his tent like the Arab and silently steals away." Sometimes the more silently, the better (for him).

This short course for contractors is a different kind for it will involve some real study. The instructor will leave in the hands of his students some tangible evidences of his sojourn with them. The field covered will be narrow and somewhat elementary, but a more advanced course will be available when the first one is finished. The work of the first course will be given as a series of five evening sessions and recitations based on carefully outlined problems contained in blue-prints and text material. During the day the instructor will be on the job to visit his students at work and to answer any individual questions. The course is intended for men already engaged in the building business, not for men without experience in the work. Those who desire to continue may take the second and more advanced course or may avail themselves of the correspondence courses offered by the college.

CORRESPONDENCE COURSES

Two courses of great interest to men in the building trades have already been published by the Engineering Extension Department—"Arithmetic for Carpenters and Builders," and "Drawing for Builders." Both of these courses deal chiefly with frame construction. The new courses planned are to cover brick and hollow-tile construction as well. Professor R. B. Dale expects to devote his time this coming summer toward getting these correspondence courses in masonry construction into proper shape. Correspondence courses may be taken by residents of states other than Iowa. The fees are small.

These three lines of instruction are intended to reach all classes of people. Any young man who can devote two years, a few nights each week, or even one week, to instruction has an opportunity to fit himself for doing more efficient and more profitable work.

The Engineering Extension Department of the Iowa State College will be glad to furnish further information about these courses to anyone who desires it.

Sibley Active in Promoting Brick Roads

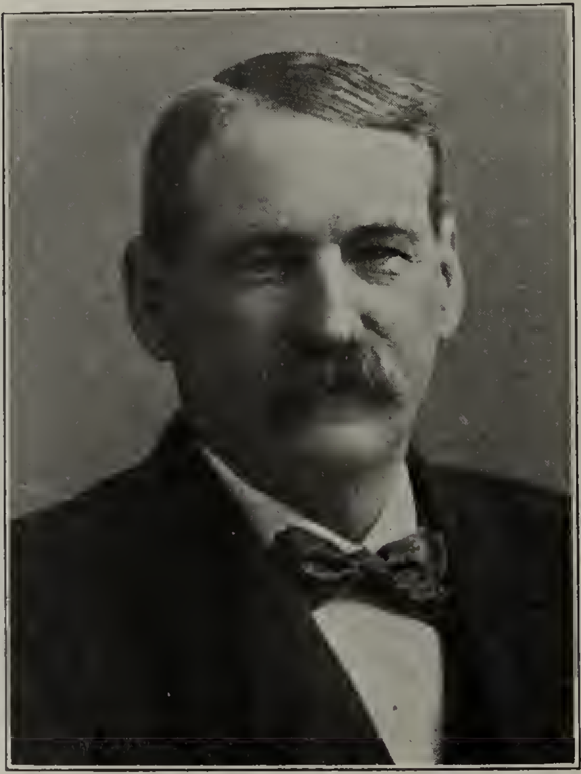
Upon his return to Birmingham, Ala., from a recent trip, John W. Sibley, secretary of the Southern Paving Brick Manufacturers' Association, announced that a contract for forty-six miles of vitrified brick road had been let by the officials of Volusia county, Fla., at a cost of $500,000. Most of the brick, he stated, would come from the Birmingham territory.

More than one hundred miles of paved highway were constructed in Florida during 1915, according to Mr. Sibley. This has proved to be one of the best investments that the state has ever made, as hundreds of automobile tourists have been attracted to this section by the good roads, with the result that thousands of dollars of revenue was derived by its business interests.

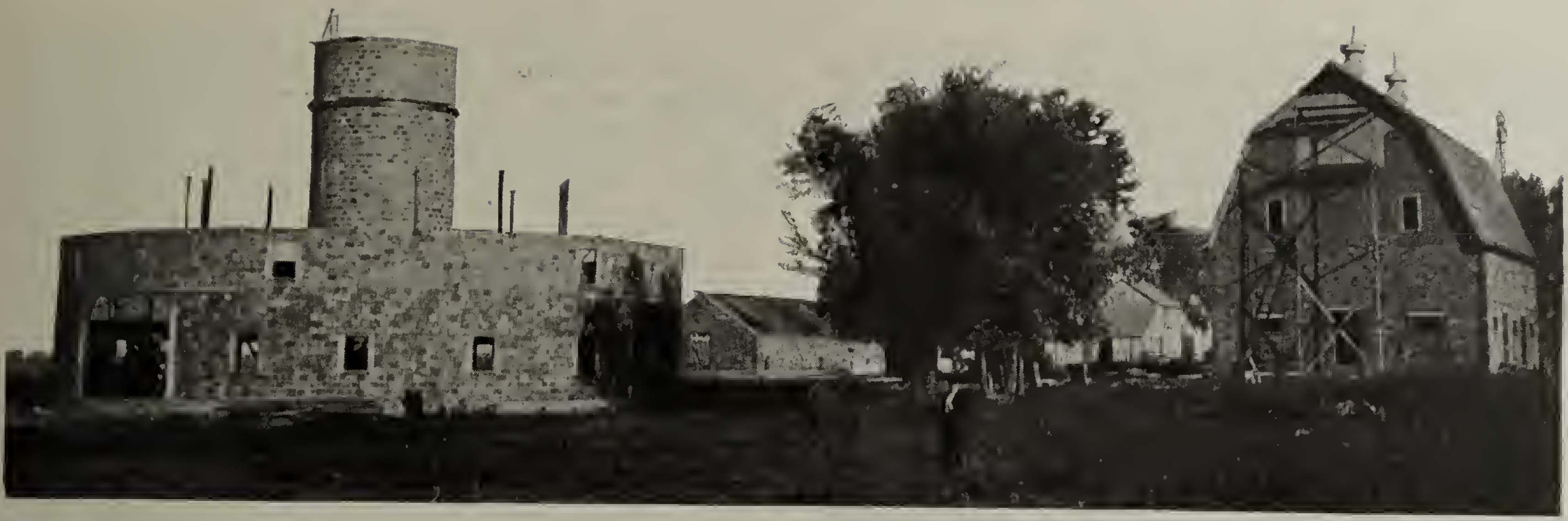
Mr. Sibley left for Greenville, Miss., recently where he was scheduled to address the local chamber of commerce on the subject of paved highways. The county officials of Greenville are contemplating the expenditure of approximately one million dollars in good roads, and it is Mr. Sibley's intention to "land" this paving for brick.

A PIONEER READER *of* "BRICK *and* CLAY RECORD"

At times it is interesting to dig into the past with its historic memories and fascinating stories. Recent reminiscences have brought to light a veteran brickmaker and pioneer reader of "Brick and Clay Record" in the person of William A. Bailey, of Northampton, Mass., whose picture is shown herewith. Mr. Bailey has subscribed to "Brick" since it was founded in July, 1894.



However, he was engaged in the business of making brick long before that time, having purchased a yard in New England in 1886. Mr. Bailey was originally a contractor and acquired the brick yard in order to manufacture his own materials. He served in the Massachusetts legislature during 1905 and 1906 and was chairman of the local school board for twenty years.



A Picturesque Farm Scene in Which Burned Clay Building Materials Are Very Much in Evidence

SURROUNDING FARM ANIMALS *with a Circle of* BURNED CLAY

Some Facts and Information Concerning the Construction of the Round Barn of Hollow-Tile, Which Every Manufacturer of That Commodity Should Know

FINDING NEW USES for burned clay building materials is one way of increasing their sale—at prices which usually bring with them an attractive margin of profit. Competition, as a rule, is less keen in new fields, and for this reason, the tendency to "shade" a price is less in evidence.

Nearly every day, it seems, reveals a new outlet for a clay product. Some of these contain great possibilities which, if developed, would swell the annual production by a large figure. Others are not so promising.

A new outlet for hollow-tile which might well be classed in the first of the two above mentioned types of use, is in the construction of round barns on the farms of this nation. It had been found that a round barn of burned clay can be built for a figure that is very close to the cost of erecting a rectangular frame barn having the same floor area. The reason for this is that it requires less material to enclose a circular space than it does a rectangular area. It is, therefore, easily understood why a round barn of hollow-tile can be built for very nearly the same cost as a frame barn. Of course, round barns are also being built of wood, but the ending and cutting of the lumber involved in the construction of this shape of building, with its accompanying waste, increases the cost somewhat and eliminates much of the competition of cheapness, which the ordinary carpenter-builder claims for a frame structure.

The round barn on the Brooks' farm in Chickasaw county, Iowa, which is shown in accompanying illustration, is sixty feet in diameter, outside measurements, and fifty-four feet from the grade line to the top of the roof. It was built by a young engineer, a graduate of the Iowa State College, during the summer of 1913.

The walls consist of hollow clay building tile laid on a concrete foundation four deep, and they are eight inches in thickness to the top of the second story, the third story walls being five inches thick. The reason for this is apparent. The upper walls, not being required to carry as heavy a load as the lower part of the building, less material is needed, thus effecting a saving in masonry costs.

The walls are reinforced over the openings and at the very top upon which the roof plate rests. Here a wooden plate, consisting of five 1x4's was bolted to the tile which was filled with cement at the top. To this were fastened the rafters, and the roof then built as shown in the accompanying drawing, being covered with 1x2 sheathing placed two inches apart, this in turn being covered with asphalt shingles. It is self-supporting, no timber heavier than 2x6 rafters being used. It can be compared to an arched cistern cover—any pressure from the wind tends to make the roof firmer and stronger. A sixty-inch ventilator tops off this roof, which is well planned, well executed and durable.

As has already been intimated, this barn was built three stories in height. The first floor or basement accommodates the cattle. Here there are nineteen stanchions extending in a semi-circular sweep around one side of the floor, while the other side is arranged to take care of the loose cattle. The stalls for the cows face toward the center of the barn. In front of them a spacious feed alley has been provided, while an equally large passageway for removing litter may be found in the rear. The feed troughs in front of the metal stanchions on the one side provide a convenient receptacle for the feed, while on the side where the loose cattle are usually quartered, an iron basket hay rack is used. On both sides of this floor, well drained gutters may be found which keep the floor in a dry and sanitary condition.

The Round Barn of Hollow-Tile on the Brooks Farm in Chickasaw County, Iowa

Leading from the basement is a stairway which terminates on the second floor where the horses are stabled. Seventeen stalls with swinging partitions provide ample accomodations for the number of horses kept on this farm of one hundred and sixty acres. A reinforced concrete floor separates the first and second stories of this barn, while the driveway, which leads up from the barnyard into the stable, is also of concrete and extends around the entire circumference of the second floor. Just to the left, as one enters the stable from the driveway, may be found three large grain bins, making a handy storage place for the oats and other grains that are fed to the horses. The doors at the entrance of the driveway are of wood, suspended on the top from iron wheeled carriages which operate on a curved track fastened to the outside wall of the building. The doors are also curved to the same radius as are the walls of the building, making, when closed, tight and well-fitting covers for this opening.

The third floor is a large, circular hay mow, in which, however, there is no dragging of hay around posts or over girders, because of the unusual roof construction employed. With a $20 haying outfit, one man in the mow can handle what would otherwise require two or even three men. The hay is pulled up over the entrance to the driveway thru a trap door in the floor of the mow. This opening is so arranged that it may be closed after using.

In the center of the barn is a silo sixteen feet in diameter and extending from the grade line of the building to the roof. Like the barn, its walls are built of hollow clay building tile eight inches in thickness to a point corresponding with the third floor joists and five inches from there to the top of the silo. When filling the silo, the cutter is placed on the second floor and the wagons loaded with corn driven up the driveway into the barn, thus making a shorter distance in which to blow the silage and overcoming about the only objection that has ever been raised to a silo being located in the center of a round barn—that it is difficult to fill. In this case, however, the silo is easily filled.

For ventilation the silo chute is used as a foul air shaft. In addition to this, the windows, of which there are a large number, are three-light 9 x 12 cellar sash hinged on top of six-light 9 x 12 barn sash, opening in at the top, and providing ample means for ventilation without creating a draft.

The large number of windows in this barn also give it a well-lit interior. On the second floor, for instance, there are sixteen windows for seventeen stalls—practically a window for every stall, while on the first floor, or basement, there are twelve windows to nineteen stalls. It must be remembered, however, that these windows are much more valuable as entrances for germ-killing sunlight than in the square or rectangular barn. The round shape of the Brook's barn enables its numerous windows to catch the sunlight no matter from what direction it comes, meaning that whenever there is any sunlight it is shining somewhere on the floors of this barn.

Convenience is probably the dominating characteristic of the barn here shown. The fact that it is round has made possible an arrangement that saves both time and labor in feeding the animals and in keeping the building clean and sanitary. In the basement, or the first floor, the cows are all fed from the center of the barn, the silo being, located there, as are also two large grain bins. The same excellent arrangement may be found on the second floor where the horses are stabled. The horses all face toward the center of the floor. With grain bins conveniently located and a hay chute leading from the third floor, the feeding and bedding of the horses is turned from a dreaded task into a pleasurable chore.

There are two litter carriers, one for the first and one for the second floor, which operate on a suspended rail, terminating at a point in the barnyard where the manure spreader is kept. In cleaning both the stables and the cow barn, it is simply necessary to shovel the litter into the carriers and send them on their journey, repeating the performance until the entire barn has been cleaned. In addition to this convenience, the driveway extending around the back of the stalls on the second floor has been made large enough to permit the driving of the spreader up onto the floor, where it can be driven around the circumference of the barn and out at the same point where it entered without having to turn or back down.

The Brooks' barn is thoroly sanitary. The concrete floors on both the first and second stories are decay-proof and dry, a condition impossible with a wooden floor. The metal stanchions are equally as sanitary, they being easily cleaned because of their small and rounded surfaces which offer little resting place for dirt or litter. Combined with these two sanitary features—concrete floor and metal stanchions—the hollow tile walls of the barn here illustrated serve to clinch the disease-defying claims of this barn. Unlike the solid type of masonry wall, those in the Brooks' barn are dry. This is due to the insulating qualities of the hollow tile used therein which act as a barrier to the transmission of temperatures thru their volume, so preventing the condensation of moisture from the warm inside air, on the walls. These hollow tile walls—made of hard-burned clay—present an extremely sanitary surface, there being no cracks or crevices for the harboring of germs, and when soiled, can be quickly cleaned with a hose.

Any Farmer Would Be Glad to Own This Barn, Especially In View of Its Moderate Cost

Perhaps the biggest advantage of the round barn—one that has won its warmest supporters—is in a saving of material when compared with the amount required for a rectangular barn having the same floor area. A round barn of wood can be built with thirty per cent less frame lumber than a square one, the absence of heavy lumber playing an important part in this reduction. No timber is needed for scaffolding, as anyone having a proper knowledge of circular building construction will have no use for a scaffold in any part of the work, effecting a saving in both labor and material. In addition to a saving in frame lumber, a smaller number of linear feet of foundation is required, less siding is needed as well as paint, and labor in erecting and finishing the structure.

But Mr. Brooks did not use a frame construction for his barn; he built in masonry at a cost that forms a very interesting comparison with what it might have been had he erected a wooden rectangular structure. The saving incident to the building of a round barn brought the cost of his masonry structure very near to that for a rectangular frame barn, but with so many additional advantages as to make this first comparison only the beginning of a long list of sound, matter-of-fact arguments in favor of the round hollow-tile barn.

Not only was the per capita cost of housing the stock on this farm reduced, but a fire-safe structure was obtained—the best insurance against the loss of prized cattle or property by fire. More than one farmer and stockman has regretted the lack of protection in this direction.

One of the chief reasons Mr. Brooks selected hollow-tile for the walls of his barn was because of the longer life and greater durability this material would give him. Requiring no paint and little or no repairs, it is safe to say that the barn here shown will be inventoried by the grandchildren of the builder at a value very little below its original cost, which was $5,000, including complete equipment.

Fireproof, Sanitary and Hospitable Well Describe this Hollow-Tile Barn Interior

There is little doubt but that the type of barn here shown is not very common on the farms of the Middle West. This is not due to the fact that it is expensive in proportion to the number of cattle and horses it houses, nor to any structural difficulties, altho it may be just a little bit new.

It is more than probable that in this last thought, may be found the real reason why more of these round barns of hollow-tile are not to be seen as one journeys along the countryside. Most farmers find following in another's footsteps easier than blazing a path for themselves, and so we find that when Smith builds a new barn, it is very much like Jones' on the next farm both in merit and in fault, as is also Williams' built just a little later.

Mr. Brooks, however, has departed from obsolete barn building architecture and has reared for himself a monument of good judgment, foresight and economy, and incidently setting the right kind of pace in barn building.

HOW *to* ESTIMATE BRICK *and* HOLLOW-TILE MASONRY

In estimating the number of brick required for a job, says the "National Builder," it is necessary to judge somewhere near the actual quantity needed. The system of estimating by bricklayers' wall count will make one-fifth too many brick, then not to figure out the openings will swell this to much more on many jobs. Bricklayers' wall count is a poor way to estimate the number of brick required to do a job. On small residence work where there are only a few small windows in the foundation, it does not make very much difference, yet even then, there is likely to be a difference of from one to two thousand brick, and on large jobs there will be a difference of several thousand, depending, of course, on the size of the job and the number and size of the openings.

Bricklayers' wall count is figured at 7½ brick per lineal foot for every 4 inches thickness of wall one foot high. To figure the brick and come close to the mark, figure 6 brick per lineal foot for every 4 inches thickness of wall, one foot high.

BRICK FOOTINGS

Brick footings may be estimated by the lineal foot as follows:

9 inch wall, 2 course footing, 10½ brick
13 inch wall, 3 course footing, 22½ brick
18 inch wall, 4 course footing, 39 brick
22 inch wall, 5 course footing, 60 brick
26 inch wall, 6 course footing, 85½ brick

To estimate the brick required for a wall, figure per lineal foot of wall, for every foot in height as follows:

4 inch wall, 6 brick per lineal foot
9 inch wall, 12 brick per lineal foot
13 inch wall, 18 brick per lineal foot
18 inch wall, 24 brick per lineal foot
22 inch wall, 30 brick per lineal foot
26 inch wall, 36 brick per lineal foot

The cost of common-brick laid in the wall will vary in different localities, according to the price of material and labor, but we will itemize the matter in such a way that any one will be able to arrive at the approximate cost in their own locality by substituting their own local prices for the prices given.

Common-brick, per 1,000	$8.30
Lime, 1 barrel	1.25
Sand, ½ yard	.70
Mason labor, 6 hours, 70c	4.20
Tender, 6 hours, 30c	1.80
Total	$16.25
Cost per 1,000 brick, actual count	$16.25
Cost by mason's wall count, about one-fifth less	13.00

It must be remembered that by the mason's wall count there are only 800 brick laid in the wall for a thousand, the mortar joints taking up the space of the 200 brick, so nearly so that it is safe to figure this way on common brickwork where the standard size of brick are used.

FACE BRICKWORK

We will now estimate the cost of walls faced with pressed or any kind of face-brick. The cost of pressed-brick and the different kinds of face-brick, varies all the way from $15 to $25 per 1,000. Then again the cost of laying them is much more than the laying of common-brick. The cost will also vary according to the design, there being quite a difference between a plain wall and one that is ornamented with numerous projections, recesses, panels, etc.

Since face-brick are not as a rule quite as large as common-brick, and the mortar joints are also smaller, they can be safely estimated at 7 brick per lineal foot of wall for every foot height of wall, figuring out for all openings.

As a rule, face walls are only 4 inches thick, but on ornamental work, projections, returns and reveals deeper than 4 inches must be figured in or you will fall short on the quantity of brick required.

The cost of laying or facing a wall with a face-brick can be estimated as follows:

1,000 face-brick	$22.00
Half barrel lime	.65
Quarter yard sand	.35
24 hours, bricklayer, at 70c	16.80
12 hours, tender, at 30c	3.60
Total	$43.40

The above figures are about right for facing the average job with a face-brick. If the cost of material and labor varies, cheaper or more expensive brick being used, you can readily arrive at a close approximate cost by substituting your prices for those given above.

HOLLOW TILE

Hollow-tile are used to a considerable extent in foundation work and in backing up of brick walls. When so used a good standard quality of tile should be purchased. Tile has the advantage of making a dry wall and one that can be plastered on direct without furring and lathing.

There are many different sizes of tile, but those in most common use in wall construction are as follows: 8¼x10¼x12 and 8¼x5⅛x12.

80 tile 8¼x10¼x12 equal 1,000 brick.
160 tile 8¼x 5⅛x12 equal 1,000 brick.
The large sizes cost about $12.25 per 100.
Small sizes about $6.50 per 100.

Now since the mason lays only 800 brick, wall count, for a thousand, one-fifth less tile will equal the mason's 800 brick; consequently we can figure as follows with a very conservative estimate:

64 large size tile, at 12¼c	$7.84
Mortar	.35
Mason work, 2 hours at 70c	1.40
Tender, 2 hours, at 30c	.60
Total	$10.19

CHIMNEY CONSTRUCTION

In chimney construction four courses of common-brick will approximately build one foot in height. The following figures are net and to be safe in estimating the brick required for chimneys, it would be wise to add five per cent for good measure in case the brick should happen to be a little smaller than standard size, and for the possible waste from breakage.

An 8x8 flue chimney will require 24 brick per lineal foot.
An 8x12 flue chimney will require 28 brick per lineal foot.
A 12x12 flue chimney will require 32 brick per lineal foot.
A 12x16 flue chimney will require 36 brick per lineal foot.
A 16x16 flue chimney will require 40 brick per lineal foot.

A double flue, 8x8 chimney will require 36 brick per lineal foot.

A double flue 8x12 chimney will require 48 brick per lineal foot.

A triple 8x12 flue chimney will require 68 brick per lineal foot.

For a chimney breast built up for a fireplace, 80 to 90 brick per lineal foot will be a fair average. Nearly all fireplace chimneys, after being built up to a point above the fireplace, generally to the ceiling over the fireplace, are reduced to a one, two or three 8x12 flue chimney, depending upon whether or not there will be a stove and furnace to connect with it, since it is not good practice to connect these with a fireplace flue.

In cities where building laws have been established it is usually required that all flues be lined thruout with fire-clay flue lining. The cost of flue lining is as follows:

8x 8,	16 cents per lineal foot
8x12,	20 cents per lineal foot
12x12,	30 cents per lineal foot
12x16,	40 cents per lineal foot
16x16,	60 cents per lineal foot

Flue lining is made in lengths of 2 feet.

From the data that has been given, it should be an easy matter to estimate the material required to build chimneys. The cost of labor may be estimated as follows:

8x 8 flue,	25 cents per lineal foot
8x12 flue,	30 cents per lineal foot
12x12 flue,	35 cents per lineal foot
12x16 flue,	40 cents per lineal foot
16x16 flue,	50 cents per lineal foot

Chimney breasts for fireplaces, $1.00 to $1.25 per lineal foot.

In estimating for chimneys it is a matter of convenience to estimate them all complete, including material and labor. In view of this we will give a list of prices for the chimneys complete, both with and without the flue lining. In using flue lining a small allowance must be made for the labor of placing it in position because it does add a little to the labor.

Chimneys	With Flue Lining	Without Flue Lining
8x 8 flue, lineal foot	$0.90	$0.70
8x12 flue, lineal foot	1.20	.95
12x12 flue, lineal foot	1.45	1.10
12x16 flue, lineal foot	1.75	1.30
16x16 flue, lineal foot	2.10	1.60
8x 8 double flue, lineal ft	1.70	1.30
8x12 double flue, lineal ft	2.20	1.70
8x12 triple flue, lineal ft	3.10	2.40

Fireplace flues, with three 8x12 flues, lined, $3.20; unlined, $2.50 per lineal foot.

War "Booms" Clayworking Industry in Japan

Since the beginning of the present European conflict, the manufacture of clay products in Japan has been greatly developed and promises to become an important industry in that country. The majority of the articles produced are intended as substitutes for German ware, such as coffee cups, tops and electrical supplies.

Significant indication of the growth of this industry in the Mikado's kingdom is contained in the fact that before the outbreak of the war, only forty per cent. of the ceramic products manufactured in Japan was exported, but this percentage has steadily increased until it has now reached the total of seventy per cent. Moreover, hand labor is rapidly giving way to machine production and coal has become the important fuel. These improvements were made necessary because many of the Japanese clayworkers had contracted for shipments before the recent rise in both the price of the kaolin and labor took place. In the face of these increasing costs of manufacture, it was only by the utilization of modern methods that a profitable business is now being operated by those clayworkers who had made contracts under the former prices.

WHY REFRACTORIES
are a WORLD NECESSITY

Wherein is Shown the Relation of this Important Branch of the Clayworking Industry to Industrial Progress, Together with Some Side Lights on the Manufacture and Characteristics of the Ware

By George A. Balz

in a paper read before the New Jersey Clayworkers' Association

THE GENERAL TERM "REFRACTORIES" must of necessity be applied to a more or less wide range of materials capable of withstanding, without fusion or other serious deterioration, temperatures of such high degree as modern industrial requirements have prescribed. Altho, unfortunately, no fixed standard has been definitely determined in this country, which may be consulted in establishing the fact of whether or not a material may be classed as a refractory, the general consensus of opinion appears to limit the temperature at which a material, classed as a refractory, may fuse or otherwise be deprived, in a measure, of its physical and chemical characteristics, to a minimum of approximately 3,100° F.

I have stated that no fixed standard of refractories has been adopted in this country, which, to a certain degree, is also true of Europe. It appears, however, that the term "refractory" is generally less abused in Europe than in America.

Under the general classification of refractories may be mentioned, as the more commonly encountered in the American industries, fire-clay material, silica material, magnesite, chromite, bauxite and graphite. Each of these materials may be considered as possessing its own distinctive applications and characteristics.

FIRE CLAY MATERIAL

Aside from refractoriness, which is generally accepted as the most important property, various products of different classes of fire-clay show a wide variation in plasticity, density, tensile strength, color, shrinkage and perhaps in chemical composition and texture. As a general rule the chemical composition of a fire-clay refractory may be taken as an index as regards the degree of its refractoriness. This rule does not apply in all instances, however, and should, therefore, not be used unless further information is available. Experience has generally taught us that when the chemical analysis of a material shows the presence of quantities of fluxing impurities, such as ferric oxide, lime, magnesia and the alkalies in a combined excess of about five per cent, the refractoriness of the particular material under consideration is open to question, and such characteristics as its texture and the relative amount of the various fluxes shown to be present should be investigated. Experience, furthermore, appears to indicate that ferric oxide tends to reduce the refractoriness of clay material more than any of the remaining fluxes which may be present.

As the term "fire-clay material" essentially indicates the derivation of the refractory, it may be well to distinguish between such material in which the percentage of alumina is high and those in which the percentage of silica is high. There appears to be a gradual tendency in this country, as well as in Europe, among consumers as well as manufacturers of refractories, to designate the former as aluminous and the latter as siliceous material, in order that the latter, when high in silica (above 75 per cent) may not be confused with "silica material," the physical characteristics of which are appreciably different from those of siliceous material.

As the large majority of fire-clay, which is mined in New Jersey and manufactured into refractory products for general application, shows upon chemical analysis a percentage of silica varying from 40 per cent to 45 per cent, our local products may, generally speaking, be classed as siliceous refractories. Unfortunately nature has not provided New Jersey with such wide-spread and abundant deposits of high alumina clays as are found in the neighboring state of Pennsylvania.

The following comparison of the chemical analyses of several fire-clay refractories, both aluminous and siliceous, may be of interest:

	Aluminous			Siliceous		
Analysis	I.	II.	III.	IV.	V.	VI.
SiO_2	51.59%	51.31%	53.05%	75.20%	77.30%	78.40%
Al_2O_3	38.26%	41.21%	41.16%	21.09%	18.99%	18.60%
Fe_2O_3	1.84%	2.55%	2.65%	1.37%	2.06%	1.50%
TiO_2	1.97%	2.45%	1.80%	1.72%	1.05%	1.00%
Alkalies	6.34%	3.48%	1.34%	0.62%	0.60%	0.50%
Sum of Fluxes	10.15%	8.48%	5.79%	3.71%	3.71%	3.00%

The analyses of the three aluminous refractories above stated are products of the states of Missouri, Kentucky and Pennslyvania, respectively, whereas those of the siliceous refractories represent local New Jersey products.

Fire-clay material is applied as a refractory in the various industries principally in the form of fire-brick of the standard dimensions 9" x 4½" x 2½", and the various modifications thereof known to the trade as standard shapes of the 9" series; it is also largely applied, particularly in the illuminating gas and metallurgical industries, in the form of molded shapes and retorts.

The method of manufacture most commonly adopted is that of tempering the clays with water after a proper mixture thereof has been effected, and the necessary plasticity-reducing material has been added. The mixture is then molded either in the form of "soft mud" or "stiff mud," by hand or thru mechanical means, and, after drying, burning the same at a temperature varying from 2,460° F. to 2,530° F.

In my opinion, the question of the degree of temperature at which fire-clay material is generally burned, is one, the importance of which has apparently not heretofore been recognized by the large majority of manufacturers. This is especially true in some of our neighboring states where underburned material is frequently encountered.

As the process of kiln burning brings about a shrinkage of the green material (except in the instance of highly siliceous clay) the degree of heat at which such burning is effected should be as high as possible, and under no circumstances lower than that degree of temperature to which it will later be heated in actual service. It is true that kiln burning at high temperature adds considerably to the production costs, especially where the manufacturer is not so fortunate as to have his plant located within a reasonable distance of his coal supply; however, I believe that the majority of consumers of fire-clay materials, especially those who use this material under conditions where failure of the refractories might develop heavy direct and contingent financial losses, would, within a reasonable time recognize and pay for the advantage of using a material reasonably free from the liability of shrinkage, which unfortunately, under certain conditions, has been known to be of a progressive nature, after the material has been installed and subjected to its operating temperature.

I do not wish to convey the impression that all tendency to subsequent shrinkage can be removed by burning fire-clay material at the proper temperature in the kilns; this unfortunately is prevented by the very nature of fire-clay refractories, especially those included under the classification of aluminous materials. The tendency of all fire-clay refractories to undergo structural changes upon overheating, either in the kiln or in actual service, operates as a limit of temperature at which fire-clay material can be used without incurring the danger of failure either by direct and accelerated softening or by other changes in shape and structure. Prof. Bleininger, in his papers on the "Effect of Over-firing upon the Structure of Clays," as well as that entitled "The Testing of Clay Refractories" (Department Bulletins Nos. 22 and 7, respectively), has spread some very valuable light upon this subject.

SILICA MATERIAL

Refractory material showing by chemical analysis a content from 94 per cent to 97 per cent of oxide of silicon (SiO_2) is, in this country, generally designated as silica material. Altho its use was for many years confined principally to the metallurgical industries, it has, during the past five or six years, encroached upon fields in which fire-clay formerly reigned supreme. It has been suggested that the entrance of silica material into the fields from which it was formerly excluded, is entirely due to its physical qualifications which are, to a certain extent, diametrically opposite to those of fire-clay material; the truth of this contention may be granted to a certain extent, but, in my opinion, this encroachment upon the field of fire-clay material is also, to an appreciable degree, due to the tendency on the part of the manufacturers of refractory clay material to permit their art, if it may be so termed, to remain in the same status in which it has found itself for the past two or three generations. It must be borne in mind that the requirements of modern industrial progress are more stringent than they were some years ago, which is perhaps partially due to the present laudable tendency to conserve the natural resources of our country. This is especially true of the illuminating gas and metallurgical coke industries, in both of which remarkable strides have been made during the past ten years.

Generally speaking, the characteristics of silica material are comparatively little known, except perhaps to actual consumers. In appearance this material is either white or yellowish white, and analyzes about as follows:

Silica	95.80%
Alumina	.98%
Ferric Oxide	.82%
Lime	1.80%
Magnesia	.14%
Alkalies	.50%

One of its chief characteristics is the expansion which it undergoes when subject to heat. This expansion, which is more or less permanent in character, should not be confused with the natural tendency of any mass to expand upon application of heat at a well defined rate, in accordance with the coefficient of expansion which it possesses. In the case of silica material this expansion continues practically to a point where absolute fusion (about 3350° F.) occurs. The advantage which silica material possesses in this regard, as compared with fire-clay material, will be at once recognized. Illuminating gas engineers and their associates, the coke oven engineers, were quick to recognize this important advantage as it eliminated a source of considerable difficulty which had been experienced in the past; such difficulty being caused by contraction or shrinkage of clay material and the resultant deformation and derangement of alignment of retorts and ovens.

It will be appreciated, however, that the expansion of the silica material presented certain difficulties which had formerly not been encountered to the same extent; these difficulties consisting of the necessity of providing means of taking care of the inherent expansion of silica material in the design of the structure in which its use was contemplated. Modern furnaces in successful operation testify to the success which attended these efforts.

Silica material is manufactured by the "soft mud" process from a rock analyzing from 97 to 98 per cent pure silica, by using slaked lime as a binder. This lime reacts chemically upon the silica at a high temperature and frits the entire mass into a solid body. As silica material expands in the kilns, as well as in the process of drying, it will be appreciated that the moulds, in which brick and special shapes are manufactured, must of necessity be somewhat smaller than the dimensions of the finished product.

The manufacture of silica material appears to be mainly confined to the state of Pennsylvania and certain parts of the south and middle west of the United States. This is perhaps, to a considerable extent, due to the fact that the deposits of silica rock, known to the trade as ganister, are more prevalent in these sections and, furthermore, that the market for silica material exists principally among the iron and steel trade, altho, as already stated, the use of silica material is gradually becoming apparent in other branches of industry.

Silica material possesses two disadvantages, which to a certain degree have operated to limit its usefulness; one of these disadvantages is the tendency to spall or crack upon sudden changes in temperature; the other being the fact that silica, unlike fire-clay material gives us no warning of any overheating, which may be present, by a gradual and perceptible shrinkage of the structure. The latter disadvantage may, however, be considered as being relatively unimportant, primarily for the reason that its melting point is very high, and secondly, because the danger of overheating is, to a certain extent, avoided by the brilliancy of its appearance under temperature which may still be considered safe. This brilliancy is undoubtedly due to the naturally white color of the material even at atmospheric temperatures. When it is considered that practical operators of furnaces are strongly inclined to depend upon their eyesight in judging temperature, rather than relying upon any of the modern pyrometers, the importance of the appearance of silica, when highly heated, will be at once apparent.

That silica material possesses a higher coefficient of heat conductivity than clay material is now no longer disputed, altho authorities are somewhat at variance as to the actual relative values. It is safe to assume, however, that the conductivity of silica material is at least from 10 per cent to 15 per cent greater than that of fire-clay material.

MAGNESITE AND BAUXITE MATERIAL

Generally speaking, magnesite and bauxite are classified as basic refractories. The raw materials from which magnesite material is manufactured is obtained, to a very limited extent, in California; the bulk of that consumed thruout the world originates in the Island of Euboea, Greece, and Styria in Austria.

The use of magnesite has become important with the marked development of the basic open-hearth steel process. Magnesite is the mineral form of magnesium carbonate and is frequently associated with impurities, among which may be mentioned lime, carbonate of iron and silica. The usual requirements of magnesite for open-hearth work are from 88 to 90 per cent magnesia (MgO), about 3 per cent silica (SiO_2), not more than 0.5 per cent alumina (Al_2O_3), about 5 per cent ferric oxide (Fe_2O_3) and not more than 1 per cent lime (CaO). The silica and ferric oxide being necessary in order that sintering may be assured, both in the manufacture of magnesite material and in building up furnace hearths.

Magnesite brick are very hard and dense, good conductors of heat (not particularly desirable), and show a marked tendency to spall under sudden changes of temperature. They are extremely refractory, showing incipient fusion at about 3,450 degrees F., and complete fusion at about 3,630 degrees F., altho softening somewhat at high temperatures.

Bauxite is the hydrated oxide of alumina and seldom occurs in the pure state, being usually found associated with silica, titanium and ferric oxides. The use of bauxite as a refractory is rather limited, altho it is gradually being applied for the lining of rotary cement kilns and will probably some day, to a large extent, replace magnesite for open-hearth furnace linings. Bauxite brick readily resist abrasion and weigh about 7.5 pounds per piece (9″ x 4½″ x 2½″). There can be no doubt but that the manufacture of bauxite material has not by far reached a perfect stage. The life of bauxite brick linings is at present still undetermined, and the excessive cost of raw material and production has probably, to a large extent, retarded the more general use of bauxite as a refractory material.

CHROMITE AND GRAPHITE

Chromite and graphite are generally classified as neutral refractories. As in the instance of magnesite, the chrome ore, used in this country for the production of chromite, is largely imported, small quantities being obtained from North Carolina and California.

Chromite brick are highly refractory, very dense and hard. They resist the chemical action of both acid and basic slags and are principally used as a neutral parting material between acid and basic refractories. Chromite withstands abrasion and rapid fluctuations of temperature more efficiently than any other refractory used, and, in addition to the application already mentioned, chromite is used for lining gas and air ports in open-hearth furnaces and sometimes for building up the bottoms of lead and copper furnaces, as well as the lining of copper converters. There is no doubt but that the very high cost of chromite material has prevented its more general use.

Carbon, in the form of graphite, is employed as a refractory material in the manufacture of crucibles for producing crucible steel, as well as for melting metals and alloys.

Carbon is the most refractory material known, as its melting point has not yet been definitely determined. It appears to soften somewhat and vaporizes at the temperature of the electric arc, about 6700 degrees Fahr.

The raw material generally used in the manufacture of graphite crucibles is Ceylon plumbago; it must contain not less than 90 per cent of pure carbon with a minimum of both iron and silicon oxides. The crushed plumbago or graphite is mixed with both calcined and raw clay of high quality. The crucible is then formed by methods similar to those used in the pottery industry. The material is then dried and annealed at a high temperature in a reducing atmosphere to avoid destruction thru the combustion of the graphite particles.

In addition to the use of graphite in the steel industry, this material is also used in the form of retorts for the distillation of scums containing gold and silver from the lead desilverization process. An essential requirement of graphite crucible is the ability to resist sudden changes of temperature without cracking.

RELATION OF REFRACTORIES TO PROGRESS

As regards the essential relation between refractories and industrial progress, it is difficult to conceive of any branch of industry into which the subject of refractory materials does not enter. One might safely say that our entire industrial life is based upon the use and efficiency of refractories. Perhaps the most readily appreciated illustration of the wonderful usefulness of refractory material is the modern steam-driven locomotive, which has been one of the pioneers of progress. The iron, steel, copper, brass and other metals of which the modern locomotive is constructed bear mute witness to the widespread use of refractories in the blast furnace, iron cupola, open-hearth furnace, smelting, heating, annealing and reverberatory furnaces, each one of which plays its own part in producing the component parts of the locomotive. When the engine of transportation is completed, refractories again enter into its construction in the form of furnace and fire-box lining, so that the necessary steam power may be safely and efficiently generated.

Another example, altho perhaps one not as readily apparent, is the modern electric light. Where water power is not available, steam is first generated in boilers, into the construction of which refractories play a most important part; the energy is then transferred to the reciprocating or turbine engine, in the construction of which refractory material, as furnace linings, is essential to the product, and finally the mechanical energy developed in the prime mover is translated to electrical energy in the generator, which is constructed of iron, copper, brass and steel, all of which require refractories in the process of transforming the raw material into the finished product.

As another example, let us take the process of steel manufacture; from the manufacture of the coke required to effect the reduction of the impurities contained in the ore, to the finished product. The coke is first produced from the coal, which has been transported to the coke works either by steam or electrical energy and devolatilized in ovens, constructed thruout of refractory materials. The iron ore, coke and other ingredients are then heated together in a blast furnace for the lining of which refractory materials of various character are essential; after the hot metal produced in the blast furnace has been conducted thru conduits lined with refractory material, it is cast into pigs. The pig-iron is then placed in the open-hearth furnace, also lined thruout with refractory material, and refined, after which the refined steel is cast into ingots, reheated and soaked in furnaces constructed of refractory material and finally rolled into the various structural and merchant shapes of which our modern structures are built.

In the wonderful strides which the art of metallurgy has made during the past generation or two, refractories have played an exceedingly important and necessary part. This can also be said of the art of illuminating gas manufacture, and it is safe to say that the resources of the manufacturer of refractory materials have, at times, been considerably strained in endeavoring to have the qualities of his product meet its requirements.

It will perhaps be of interest to learn the value of the annual production of refractory material in the United States, as published by the United States Geological Survey. During the year 1913, there were produced refractories (exclusive of stove lining) having a total value of $20,627,122, to which may be added the value of stove lining material, equal to $535,677, or a total of $21,162,787, or over 11 per cent of the total value of the entire output of clay products from common building brick to the most valuable art pottery. During the year 1912, the total value of refractories (including stove lining) is stated as $18,394,503, thus showing an increase of more than 15% in value during the year 1913.

During the year 1909 the total production in the United States, of pig iron, silver, copper, lead and zinc, in the manufacture of each of which it may safely be assumed that refractories were essential, shows a value of $945,038,379, with a value of refractories produced during the same period of $17,044,278.

In order to promote a better understanding between the manufacturer and the consumer of refractory material, action is now being taken by several prominent associations in this country to define more clearly the requirements of refractories for the various industries, which will undoubtedly be of great mutual benefit and must necessarily reflect favorably upon the advancement and development of the refractory material industry. As prime movers in this direction, the industry is greatly indebted to such men as Prof. Bleininger, Prof. Orton, Prof. Kanolt and others, together with their associates and assistants.

Detroiters Form New Face Brick Company

Frank L. Shafer, Harry T. Jenney and Edward G. Prout, all formerly associated with the F. B. Stevens Company, Detroit, Mich., have resigned and are engaged in business for themselves under the name of the Frank L. Shafer Company, with offices and display rooms at 807 Kresge building, Detroit. Mr. Shafer was manager of the brick department of the Stevens Company for eight years. The new firm will specialize in the sale of high-grade face-brick of all shades and textures, fire-brick and hollow-tile. Among the concerns which they represent are the Everhard Brick Company, Massillon, Ohio; Colonial Brick Company, Mogadore, Ohio; Johnetta Brick Company, Johnetta, Pa.; Warren B. Ferris Brick Company, Columbus, Ohio; Acme Brick Company, Marietta, Ohio, and Darlington Brick and Mining Company, Darlington, Pa. The new company will make all deliveries to its customers by means of motor trucks, starting with two large trucks and a number of smaller ones. Other trucks will be added as needed.

PROSPERITY *hits* CLEVELAND PLANTS

Due to the greatly improved market for clay products in the "Sixth City," brick and hollow-tile plants in the Cleveland (Ohio) district are planning many enlargements and improvements this spring.

Conspicuous among these is the addition of a new unit to the plants of the Barkwill Brick Company, of which E. S. Barkwill is secretary and treasurer, that will produce 60,000 brick per day. Nor will the other plants of this company be neglected so far as improvements are concerned. A new soft-mud brick machine, driers, a new kiln building and additional motor trucks will be purchased to increase the capacity and accelerate the delivery of this company's products. For instance, plant No. 2 at Bradley Road on the west side of Cleveland, will soon be producing 120,000 common building brick a day—a capacity equal to that of the No. 1 factory, the pit of which is shown in the other accompanying illustrations. This picture shows a unique method of gathering clay which employs two steam shovels and a locomotive crane.

The No. 2 Plant of the Barkwill Brick Company at Cleveland, Ohio

Two Steam Shovels and a Locomotive Crane are Used at the Pit of the No. 1 Plant

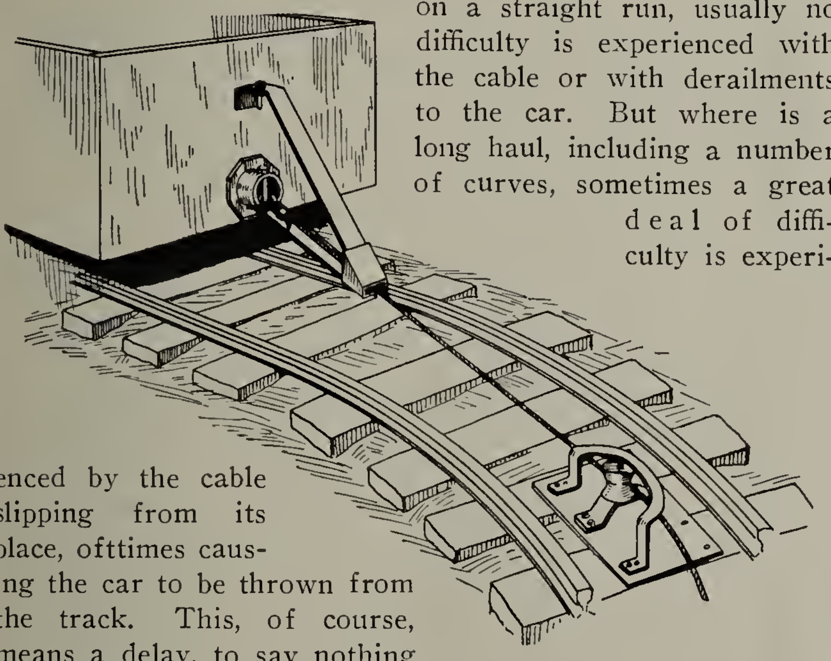
The Barkwill Brick Company manufactures both common-brick and hollow-tile, operating three plants. In addition to this, it is disposing of the entire output of the Cuyahoga Brick and Shale Company and Cullen Brothers Company.

The SUPERINTENDENT

Helpful Hints for Practical Men Whose Problem is Maximum Production With Minimum Cost

Eliminating Clay Car Cable Trouble

The equipment in use on a majority of plants for transporting the clay from the pit to the machine room usually includes a winding drum and cable, one end of the latter being attached to the clay car, while the other end is fastened to the drum. Where the cars are hauled up the incline on a straight run, usually no difficulty is experienced with the cable or with derailments to the car. But where is a long haul, including a number of curves, sometimes a great deal of difficulty is experienced by the cable slipping from its place, ofttimes causing the car to be thrown from the track. This, of course, means a delay, to say nothing of the damage to the equipment.



On many plants where the last-mentioned condition exists, a "dolly" or metal spool is used to overcome this slipping of the cable. These are placed at curves in the track, providing a means of keeping the cable in line. But even where this is done, there is often trouble in the cable catching on the "dolly" and sticking there. This might snap the cable or break the "dolly" or damage the car.

The appliance illustrated in the accompanying sketch shows the method followed by an Iowa drain-tile plant in overcoming this difficulty. It is in the form of an arm attachment to the end of the car to which the cable is fastened. This arm is composed of two pieces, one being attached to the upper part of the car and the other to the lower part. These pieces join about eighteen inches in front of the car and both are fastened so that they can swing freely from side to side. While the construction of the upper piece of the arm is very simple, the lower one is somewhat complicated. It consists of a hollow cylinder about six inches in diameter and three inches high, cast with a flat bottom that can be bolted to the car. A heavy bolt is passed thru holes bored in the top and bottom of this metal cylinder, this bolt holding a link to which the cable is attached inside the cylinder. This cylinder also serves to hold the lower piece of the arm in position, allowing it a limited radius in which to swing. The cable passes thru the joint formed by the two arm pieces.

The other part of the appliance is a "dolly" shield, or a strip of iron about one-half inch thick, so shaped that it forms a curve above the spool. This shield is securely spiked to the ties in the track.

On the return trip from the top of the incline, as the car passes over the "dolly," the shield, which is so fixed that it is a little higher than the joint formed by the two arm pieces on the car, hits the arm and throws it over to the desired side. This motion swings the arm in such a way that the cable catches onto the "dolly" and runs down to the center where it stays, thus keeping it in line, even tho the car takes a sudden turn.

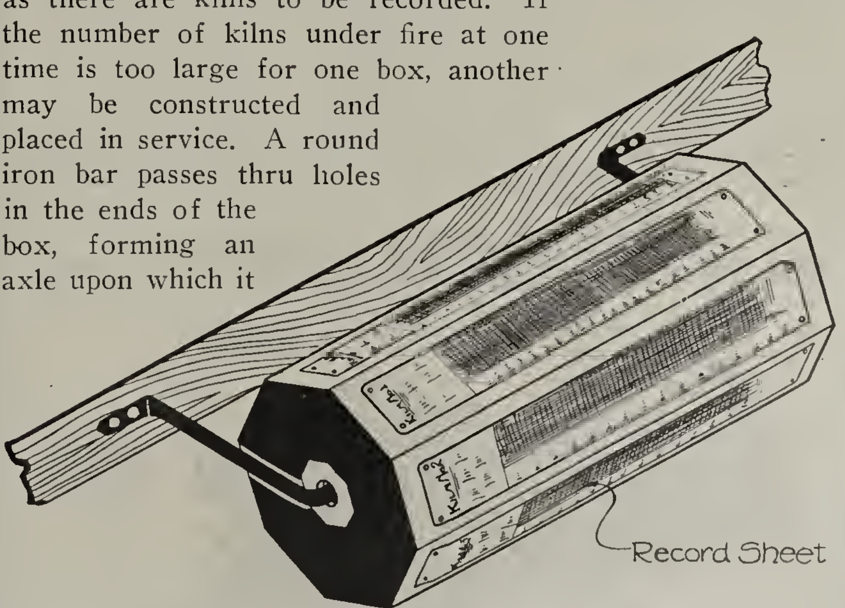
The haul made on the plant where this appliance is in use, consists of more than four hundred feet, containing many curves and irregularities. It is needless to say that the device here shown has proven very satisfactory and has eliminated much of the trouble and delay that was formerly experienced.

Keeping Clean and Accurate Pyrometer Records

While a large number of the pyrometers in use on the clay plants of this country are of the recording type and no difficulty is experienced in keeping records in a neat, convenient and accurate form, yet not a few use indicating pyrometers and are therefore in need of an appliance that will assist in keeping records systematically. The usual method followed on these last mentioned plants is to pile the record sheets together and, as the reading of each kiln is taken, the sheet upon which the record of that particular burn and settle is being made, must be uncovered—or rather discovered—by the burner who, in separating it from the rest, generally transports a portion of the coal pile to the surface of the sheet. Where this "system" is used, an excellent opportunity is provided for marking on the wrong sheet, which produces an inaccurate as well as dirty record.

A simple device that can be used on any plant employing the indicating type of pyrometer, is shown in the accompanying illustration. This device will keep the records in good condition and minimize the possibility of making mistakes.

It is in the form of a long, hollow box with as many sides as there are kilns to be recorded. If the number of kilns under fire at one time is too large for one box, another may be constructed and placed in service. A round iron bar passes thru holes in the ends of the box, forming an axle upon which it revolves. The ends of this bar are fastened to the wall at the proper height from the floor, providing a means of preserving kiln records that cannot be lost or taken away.



The sides of this record holder are made of soft wood, the sheets being fastened to them with thumb tacks. Each sheet is placed in numerical order according to the number

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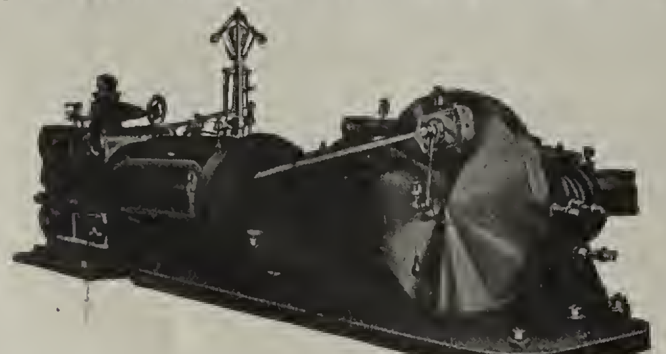

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of the kiln. The sheets may be ruled for temperature readings at set intervals, and also for a record of the settle.

The method of using this device is simple and within the understanding of any burner. After throwing in the switch to take the reading of the desired kiln, he turns to the record holder and revolves it until the sheet appears which bears the number corresponding to the number of the kiln the reading for which he has just taken, and makes his notation thereon. The same method can be followed in keeping the settle record.

Some Interesting Mistakes in Brickmaking

Under the above heading, the article which is reprinted below, recently appeared in "The Brick and Pottery Trades Journal," an English clayworking paper. Owing to the difference in equipment and management that exists between American clay plants and those across the water, some of the mistakes touched upon will have no important lesson for many superintendents or managers; on the other hand, some are worth a careful reading. The article as a whole is of such general interest and contains so much food for reflection that it is given below:

The mistakes made in brickmaking are usually the result of either carelessness or ignorance; the latter are regrettable, but can only be overcome by gaining more knowledge, either directly or by calling in an expert with the necessary skill and information.

Mistakes due to carelessness are far reaching and are continually felt in every department of a brick plant, and no matter how small and unimportant a single mistake may be, it often becomes very serious in some of its consequences. The man who is accustomed to lighting his pipe with a piece of waste paper may not do anything wrong if he is invariably careful, but he always exposes himself to the risk of using a postal order or a cheque by mistake, with dire consequences. This has happened twice within the last few months in two separate plants (in England). In one case the money was recovered on signing an indemnity form, but the other was a dead loss.

Mistakes, which are the result of carelessness in the plant, have usually one of four consequences; they cause injury to one or more men, they result in damage to the machines or tools, they are a means of damage to the ware being made and they are a forerunner of inaccurate work. In each case they mean loss to the employer and should be reduced as far as possible. Mistakes cannot be avoided entirely so long as there is the human factor to consider, but by skillful oversight they may be reduced to a much smaller amount than is common at the present time.

DANGER IN WORKING TOO FAST

Excessive speed of working is a common cause of mistakes and is peculiarly difficult to avoid, as men cannot continue to work at a rate which is greater than their normal speed without serious risk of error. This is a factor which cannot be altered except in so far as men can be trained to work more rapidly as their experience lengthens, or their work is studied in such a manner as to remove all unnecessary movements, every facility being given for their work that it might be executed at a rapid rate.

The importance of keeping the floors clean and free from wet clay cannot be over-emphasized, as a man may easily meet with an injury by slipping on a dirty floor,

and nowadays injuries are expensive luxuries to firms. In one plant a special form of vacuum cleaner is used to collect all the clay from the floors of the workshops. This effects a double purpose, as it saves risks of injury to the carriers and it also prevents a waste of clay, as the material so recovered is used for cheap articles, in the manufacture of which a little dirt is of no importance. Not long ago a man was seriously injured in a brick plant because the pump connections were leaky and made the floor near by greasy and sticky. The man was tightening a screw with a wrench and his feet slipped on the floor, with the result that he was badly injured in his fall, and apart from other bruises, he lost the sight of one eye. It was a mistake to let the leak continue, it was a mistake to have a slippery floor in the proximity of moving machinery, but there was no one on the plant who anticipated that either of these mistakes would have had so tragic a result.

REPLACING BELTS ON MOVING PULLEYS

It is a common mistake to replace belts on pulleys while the machinery is in motion, and sooner or later it must result in an accident. Yet in many plants these mistakes are made weekly and sometimes oftener. They are curious mistakes, for stopping the machinery is a simple process, and if it is not done, a man may throw away his life as the result of a trifling miscalculation.

Accidents resulting in damage to machines are more frequently the result of ignorance than carelessness, altho the roughness of the work in many plants makes many men careless—familiarity breeding contempt of the possible dangers—and a machine is sometimes forced to attempt work which it is unable to accomplish, with the result that some part is strained or may even break. Such carelessness is usually the fault of the foreman, who does not exercise sufficient oversight, altho the most careful foreman may occasionally be unable to prevent a man from doing something foolish and so damaging a machine.

A curious mistake of this kind occurred when the blades of a double mixer were taken out and replaced by new ones, the latter being put in "wrong way round." The machine was started and clay put in; it was evident that something was wrong, but the machine was "forced" and eventually the pan of the mixer was cracked.

CARELESSNESS TAKES HEAVY TOLL

Carelessness which results in damage to the ware being manufactured is so common that much of it escapes criticism. Thousands of brick are damaged each week by careless handling in all stages of manufacture, but rather specially in taking to and from the kiln. Failure to repair a press which is becoming worn often results in serious damage to brick, and in more than one case, brick have been rejected by the purchaser simply because they were not sufficiently accurate in size on account of the excessive wear of a mould or press. In one plant in particular, three presses were used. Two were re-lined, but the third was left. Eventually a large order was obtained and all three presses were used at once in order to fill it. When one of the walls had been erected the owner of the building (who was an artist) drew the attention of the architect to the fact that the bricks were not all the same size, this giving a curious effect to the bond and the level of the courses. Careful measurements were made, and after a considerable amount of investigation it was found that the large brick came from the worn press box. This resulted in a heavy loss to the brick manufacturer

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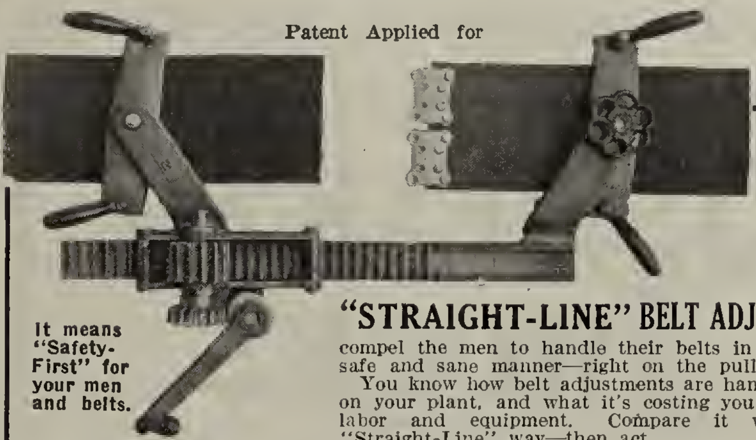

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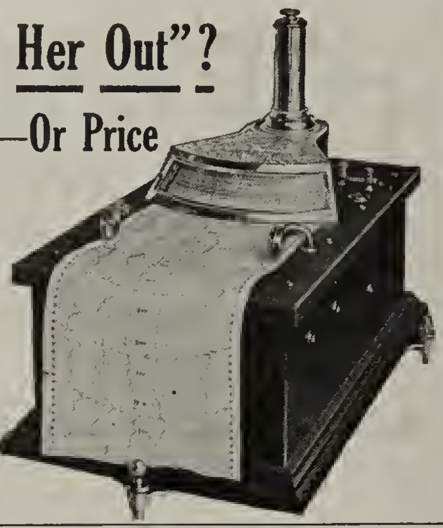

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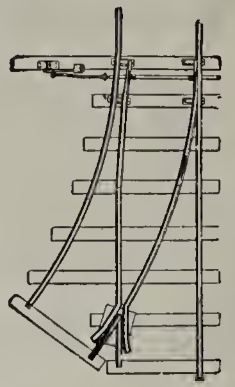

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as the wall had to be pulled down and rebuilt with selected brick. It was a simple mistake which might be made in any plant under similar conditions, but it robbed the order of much of the profit it was expected to yield, and paved the way for the subsequent bankruptcy of the brick manufacturer.

LITTLE MISTAKE RESULTS IN MUCH TROUBLE

Inaccurate work is often the result of curious mistakes. In one terra cotta works a modeler accidentally picked up an ordinary scale instead of a contraction one, with the result that one piece of moulding of elaborate design was executed about 3 in. too small to fit in with the rest of the work. The mistake—which took a long time to trace to its origin—was finally rectified by carefully fitting plain pieces of terra cotta to fill the vacant spaces, and fortunately these did not spoil the effect to the ordinary observer. This was another mistake which can easily be made and one which it is exceedingly difficult to avoid at times. In the works in which it was made, strict orders were given that all the contraction scales should be of large size so that they could not be used by mistake, and all drawings were carefully dimensioned before being handed to the modelers.

Carelessness in making the mixtures of clay and grog is a common result of variations in the size of the ware which may lead to trouble later, and the variable amount of water in a clay-paste is another source of error which it is difficult to check. The easiest way is to “feel” the material as it leaves the mixer or other machine and to work up a little of the clay with the fingers in order to see that it is neither too stiff nor too soft. A double tap on the water supply is also useful. One tap controls the maximum amount of water which can be supplied, the other acts as a regulator. By using one tap to shut the water on and off and the other to regulate the flow, it is possible to keep the paste at a high level of consistency, whereas the use of only one tap leads to much greater variation. In this connection one curious mistake is worth recording; the old perforated pipe by means of which the water was added was replaced by a sprinkler top from a watering can, which certainly looked better and was more efficient. The effect on the clay was entirely different from what was expected, and altho the same quantity of water was used, the clay was very irregular in texture. It was found, later, that a much more uniform mixture was obtained by the use of a long perforated pipe than by means of a round sprinkler, and the former was replaced with entirely satisfactory results.

USE PALLETTS, NOT FINGERS

Inaccurate work is often produced by wrong methods of handling the brick, particularly those in a somewhat tender state, such as before drying or those on their way to the kiln. Brick made of delicate clay should be handled with pallett boards and not with the fingers, as the latter exert too much local pressure instead of a widely distributed one. To use pallett boards may be slower and, therefore more expensive, but in some cases this is compensated by the reduction in damaged brick.

The setters in many plants are among the most important causes of damage by carelessness; if they space the brick irregularly, the kiln can never be evenly burned, yet how rarely is a well-set kiln to be seen. Greater care in this respect would usually prove remunerative in consequence of the better appearance of the brick which are drawn from the kiln.

A Novel Use for Dynamite

Somebody bobs up almost every day with a new idea in which dynamite can be used advantageously.

A Nebraska blaster includes this startling question in a recent letter to a large dynamite manufacturer: "You wouldn't think a man could use dynamite in re-building a steam engine, would you?"

He then goes on to explain that he is an engineer by trade, that he has always had a lot of trouble in removing keys from pulleys but that his troubles are now over because he has discovered that he can jar a tight key loose simply by placing a teaspoonful of forty per cent red cross dynamite against the end of the key, mud-capping the charge and letting the dynamite do the rest.

Of course, care would have to be exercised in placing a charge of this kind to avoid breaking the pulley or the key.

You and Ambition

What are you trying to do?

Are you just jogging along, earning your pay, taking your income as it comes in, satisfied to save a little money each year and all the while to keep edging along toward the end?

Or are you trying to accomplish something with your life, trying to get somewhere, trying to be somebody or something worth while?

You either have an ambition to advance, or you are satisfied to stand still.

If you have no ambition, excuse us for breaking into your slumbers.

If you have ambition, let us encourage you to stick to your effort to climb.

Not every one who climbs gets to the top, but the man who keeps climbing keeps getting nearer the top.

The man who does not climb, dies in the rut; he might better die in a trench.

Keep it in your mind that you are going to be something more than an average business man, that you are going to get your head at least a little way above the heads of those around you.

When you find yourself settling back, taking it easy, thinking that perhaps after all it is not worth while to struggle so hard to get ahead, just take a day or a week off and get out, away from home, in touch with some of the people who are doing the bigger things, living the lives of wider horizon.

See what others are doing and how much worth while they deem it to keep trying to be something better.

You will get a renewal of ambition in this way and come back determined to dig in.

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Here's to the wise young business man who doesn't work on the foolish plan that he can do anything any one can without any need of learning!

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Here's to the man who sees the need of having some good trade journal to read, something to give him a business lead when his own ideas run out!

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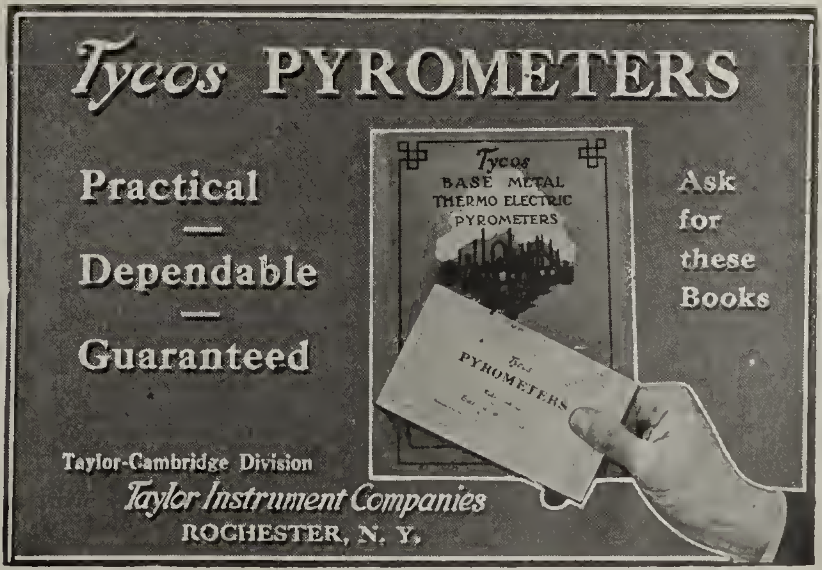

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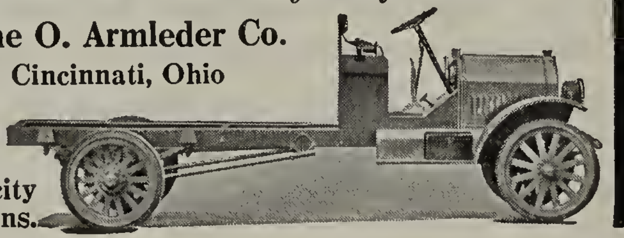

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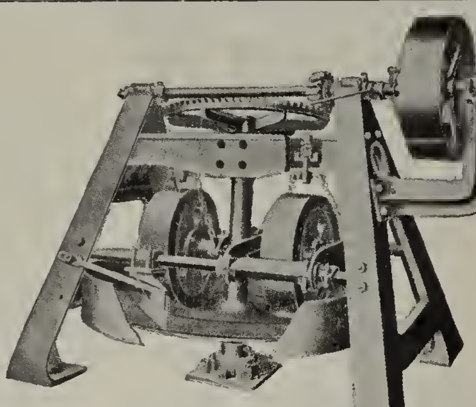

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Wet Clay Sticks in Elevator Buckets

753. *Indiana—We have recently had considerable trouble with the perpendicular elevator which we have in use at our plant for elevating wet clay to the steam press, on account of it sticking to the elevator buckets. We have been using oil on these buckets which, of course, relieves the situation considerably and works exceptionally well, but we know that we are going to get into trouble by the oil ruining the belt in a very short time. We would be glad to have you, or any of your readers, advise us what their experience has been in overcoming this difficulty—one with which nearly every clay plant has to contend at one time or another. If using oil is a good way to overcome the trouble with the wet clay, what kind of a belt could we use that would not be injured by the application of oil to the buckets?*

The above question, together with an answer, was published in the April 4 issue of this magazine. Since that time an experienced superintendent has offered a solution somewhat different from that which was suggested in the above-mentioned issue.

This reader declares that the cheapest and best way to overcome your trouble, if you are using sheet iron buckets, is to bolt a piece of wood to the top of each bucket, nailing a strip of canvas to it. He suggests that the piece of wood be fastened on the inside of the bucket where it joins on to the belt and that a good heavy canvas be used with seams sewn on both edges to keep it from raveling. The canvas should be tacked on one end, that is, in the back of the bucket, the front end being left loose so that when the elevator buckets go over the top of the pulley, the canvas will throw the clay from them.

This reader states that he is using this method of handling a wet, sticky clay and finds it very successful. He suggests that if anyone wishes to try it, that they take a 4 by 4 in. timber, sawing it slantways to make the wood pieces wedge-shaped. The pieces should be cut about one inch shorter than the width of the belt and that, if a large belt is used, a 6 by 6 in. stick of hard wood would probably serve the purpose better. He states that he is using an 18 in. belt, 125 feet long at his plant with a very sticky clay and that during March he manufactured 2,522 tons of ware, which is good evidence that the elevator is working well. This superintendent will be glad to go into the matter further, giving a more detailed description to any who desire to follow the method above outlined.

Still another solution is offered for our correspondent's problem in connection with the handling of sticky clay. It is in the form of a striking rod appliance, as shown in the accompanying illustration, which is intended for use on elevators working with a clay that has become moist or damp and for that reason sticks to the buckets.

The device consists of an iron support arched over the head of the elevator where the belt with its buckets turns over the top pulley and starts its downward course. A long

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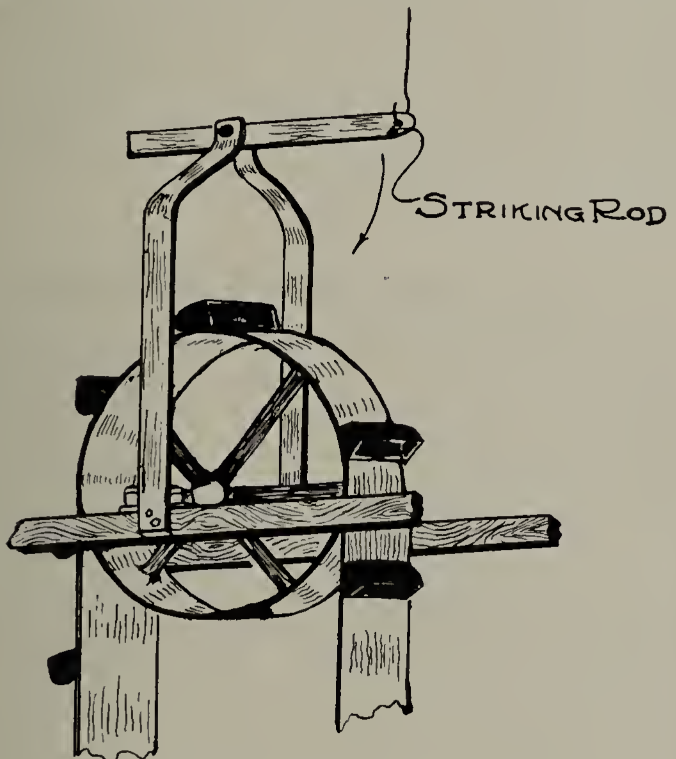
and ANSWERS

Best Authorities in Every Clayworking Branch are Called into Consultation — Their Advice is Free to You, Thru These Columns

Should a reply be desired by letter, send a stamped and addressed envelope with your question, and it will be answered promptly.

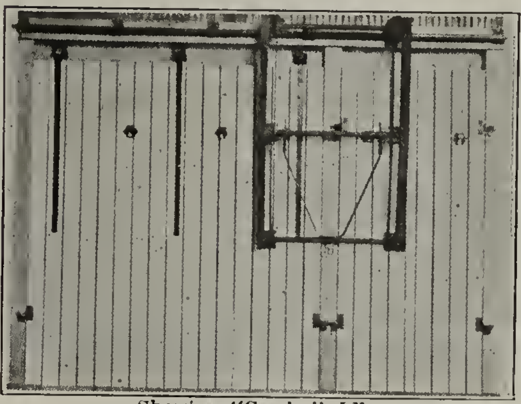
iron rod is fastened to this support which, when let down from the hook, which is also shown herewith, strikes each bucket as it goes over the pulley, giving it a slight jar. This is sufficient to loosen the clay inclined to stick, but not hard enough to injure the bucket. This rod may be put in or taken out of service very readily by means of the hook. The two pieces that form the arched support are curved so that they meet directly over the head of the pulley, and it is between these two pieces that the striking rod is held by a bolt passing thru all three. The bolt is not made too tight to interfere with the free swing of the striking rod which receives a momentum from the moving buckets as they come over the head of the pulley and strike the rod as it is swinging back.



Kilns for Burning Lime-bond Silica Brick

767. *Pennsylvania—We are figuring on building an addition to our present plant for the purpose of manufacturing lime-bond silica brick. We would like to know what type of kiln you would recommend as being the best suited for burning this kind of brick. We are figuring on building down-draft rectangular kilns about 30 ft. by 14 ft. 6 in. by 9 ft., having three fire-boxes on each end with a flue leading from the center of the kiln to the stack, placing three kilns to one stack. We would like to know how large the flues should be, also the diameter and height of the stack.*

Almost any type of down-draft kiln is suited to the burning of lime-bond silica brick. The only extraordinary requirement is that the lining of the kiln and of the fire-boxes be very refractory, as these brick often require temperatures as high as cone 12 to 16. Silica brick have been burned success-



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All Sections from 12 lb. to 40 lb. per yard
Write or wire us, when in need.
No order too large to handle promptly or too small to secure immediate attention.

fully in kilns which were designed for the burning of face-brick.

There is nothing wrong in the dimensions above stated. We believe you are making a mistake in placing the fire-boxes at the ends of the kilns. By doing this you will make it necessary for the fire to travel over a distance of fifteen feet to the center flue, whereas, if the fire-boxes were placed on the sides of the kiln, it would only be necessary for the fire to travel a distance of seven feet, three inches. The arrangement of the fire-boxes and the flues in the kilns which you are planning to build, is very much like that used on a certain Pennsylvania fire-brick plant. These kilns have the fire-boxes in the end. A close examination of their performance in comparison with that of other types which are used in the burning of refractories, shows that better results are obtained with round down-draft and rectangular kilns, having the fire-boxes on the side. This is especially true with regard to fuel consumption.

If you will refer to the article by A. F. Greaves-Walker on "The Design and Construction of Down-Draft Kilns" appearing on page 343 of the Sept. 7 issue and on page 427 of the Sept. 21, 1915, issue of "Brick and Clay Record," you will find therein the data for figuring the size of the flues, fire-boxes and stack. The author states that these particular figures have been used in the construction of kilns for burning silica brick, with excellent results.

How to Make Sticky Clay Workable

762. *Saskatchewan—The clay in these parts is of a sticky nature, and I have been wondering if it would make brick provided there was mixed with it some sort of gritty substance, such as ashes or coal cinders, of which a considerable quantity is available in this city. If you have any information on this subject, I would be glad to have you forward same to me, or if you know of any manufacturers who are using these substances for working a sticky clay, I would be glad if you would give me their names and addresses.*

In the western provinces of Canada and the central western states of the United States, the chief difficulty encountered in working clays is that of stickiness, and its consequent high shrinkage and cracking in drying. To make use of this type of clays, four methods have been developed to overcome the stickiness and excessive shrinkage, depending upon the degree to which these troublesome properties are present, viz.:

1. Clays that are mildly sticky may be made workable by the addition of sand or other non-plastic material, such as cinders, as you suggest, but we know of no place where cinders are used on this continent for this purpose. Sand deposits are usually plentiful enough to be available for mixing with clay.

2. By the addition of simple chemical coagulants, such as common salt, lime, etc., the sticky nature may be reduced more or less, so that drying the clay ware may be accomplished with a fair degree of success.

3. Clays that are too sticky to yield to the above described treatment have to be preheated to about 500 degrees C. before they can be worked by either the wet or dry-press processes.

4. By burning the clay to redness, then grinding the clinker, mixing with five per cent of lime, and hardening under steam pressure in chambers similar to those used in making sand-lime brick, a fair quality of brick can be made.

We would suggest your sending a three-pound sample of your clay to the Director of the Mines Branch, Department of Mines, Ottawa, Ont., Canada, for free examination.

Wants to Make His Own Analyses

758. *Illinois—In your book "Clayworking Problems," there is a question asked by No. 680, Quebec, in which, according to my opinion, you do not clearly explain about the analysis of lime. We are very much troubled with both sulphur and lime and I would like to be in a position to make my own analyses of our shale so that I can tell how much iron, lime, sulphur, magnesia, silica and alumina is contained in the shale and whether this proportion changes as we get further back into our bank. I would like to be able to do this without going into a great amount of expense for chemicals and utensils.*

I have been reading Jackson's "Text Book on Ceramic Calculations" and note that on page 3 (examples 3 and 4) the answer is given but the author does not describe the manner in which this solution was arrived at.

The same may be said in connection with the Bischof formula published on page 176 of Ries' "Clays: Their Occurrence, Properties and Uses."

The above question, together with an answer, was published in the March 21 issue of this magazine. Since then, one of our readers, an experienced chemist, has volunteered a detailed description of a method of finding the sulphur, iron and lime content in our correspondent's shale. He writes as follows:

"To experiment with chemicals in this day is very costly, and I only can recommend sincerely not to try it at all, as you will experience many disappointments, will get disgusted with your mistakes, and your successes, if such they may be called, will be very poor ones.

"It is a very hard task for anyone to explain to a layman, who has not the least experience, how to conduct a chemical analysis, since such work requires trained hands. However, you may be able to determine the sulphur, iron and calcium content of your shale by the following method:

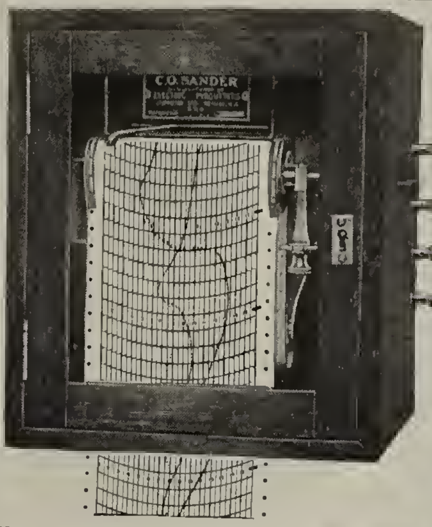
"Take one gram of the sample, dry to 105 degrees C. (Centigrade), then place it in a 150 c.c. (cubic centimeter) flask, adding about 20 c.c. of C.P. (chemically pure) diluted sulphuric acid—one part of acid to two parts of distilled water—letting it stand for from twenty-four to forty-eight hours.

"During this time the flask with its contents should be shaken three or four times. After standing twenty-four hours, more distilled water should be added, then decanted thru filter paper into a beaker. More water is added to the flask and thoroly shaken, then the whole contents is poured on the filter paper and washed twice with distilled water.

"When the liquid has ceased to run thru the filter, place the beaker on a wire gauze and heat gently to boiling. After removing the beaker, add about 5 to 10 grams of zinc (mossy), cover with a watch glass and let stand until chemical action has ceased. Then filter and wash as quickly as possible. Add titrate with potassium permanganate solution from a burette. This permanganate solution is prepared as follows:

"Dissolve 6 grams of the C.P. potassium permanganate in nearly one liter of distilled water. Let it stand for about one week in a well stoppered amber bottle. Then weigh out two portions of perfectly pure iron ammonium sulphate—weigh one portion .7 grams and one 1.4 grams—place these samples in two 300 c.c. beakers, adding about 50 c.c. of distilled water, 20 c.c. diluted C.P. sulphuric acid in each, and then dilute to 150 c.c. with cold water.

"Titrate each sample from a burette with the potassium permanganate solution as rapidly as possible to avoid oxidation until the solution is tinged with a permanent pink color. As the iron ammonium sulphate contains exactly one-seventh



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They know that a given proportion will give uniform results in every part of the work and that there need be no guessing as to strength, or uniformity or fineness. Prompt deliveries always.

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its weight of metallic iron, the sample weighing .7 gram contains .1 gram of iron and should, therefore, require 10 c.c. of the permanganate solution to oxidize it, and the sample weighing 1.4 grams should require 20 c.c.

"If the solution is made exactly, then 1 c.c. of the permanganate solution will oxidize .01 gram of iron; each c.c. therefore will represent one per cent of iron when one gram of the sample is taken for analysis. (See "Essentials of Volumetric Analysis," by Schimpf.)

"From the above it can be seen that it is not an easy task but requires skill and experience.

"If you wish to determine the sulphur in your shale, take one gram of the shale, pulverize very fine, say to pass 80 mesh, dry it to 200 degrees C. to remove all the moisture present. Then let it cool in a desiccator. Following this, treat it for twenty-four hours with a solution of ammonium carbonate. (To prepare this solution, dissolve 100 grams of the solid C.P. ammonium carbonate in 300 c.c. of distilled water and 100 c.c. of C.P. concentrated ammonium hydroxide, then dilute the whole to 500 c.c. with distilled water and let it stand for twenty-four hours before use.)

"Take a 150 c.c. flask. Rinse it out with distilled water. Place the dry shale sample into the flask and add the ammonium carbonate solution—enough to cover the sample in the flask, say about from 25 c.c. to 35 c.c. Place a rubber stopper on the flask and let it stand for twenty-four hours, during which time shake it occasionally. Be very careful that after shaking no particles of the shale stick to the wall of the flask.

"The chemical action which takes place during this period is indicated below, if calcium sulphate is present in the sample:

$$CaSO_4 + (NH_4)_2CO_3 = CaCO_3 + (NH_4)_2SO_4$$

"Sulphate of lime is decomposed into carbonate of lime, and into sulphate of ammonium. After twenty-four hours have elapsed, the flask is emptied into a beaker thru the filter, and washed well. In the filtrate are the calcium carbonate and ammonium sulphate, also magnesia, etc.

"After filtration has been completed, at least five per cent C.P. hydrochloric acid is added to the filtrate in the beaker. Then place on the wire gauze and heat gently to boiling, adding barium chloride solution (barium chloride solution is prepared by dissolving 10 grams solid C.P. barium chloride in 100 c.c. of distilled water), in sufficient excess. Heat the solution. The sulphur will combine with the barium forming a white precipitate of barium sulphate. Filter it hot and wash with hot water. Let it dry and then weigh in a porcelain crucible. Ignite in the weighed porcelain crucible and the residue is barium sulphate. And then calculate the weight of the sulphur by the following factors:

$$\text{W. of S.} = \text{W. of BaSO} \times .13756$$
$$\text{W. of } SO_3 = \text{W. of BaSO} \times .34352$$

"For calcium, boil the filtrate to 200 c.c. and precipitate the calcium by a solution of ammonium oxalate. After standing over night the calcium oxalate is filtered off. Ignite the wet precipitate in a platinum crucible and weigh as calcium oxide. (See W. F. Hillebrand's "Analysis of Silicate and Carbonate Rocks"); also Analytical Chemistry, Treadwell Hall, Volume 2, pages 70, 494, 566 and 623."

On April 22 the large and modern plant of the Consolidated Manufacturing Company, Grafton, W. Va., will be offered at public sale by the courts. It is intimated that interests at Sebring and Liverpool, Ohio, have been inspecting the property, and that it will be sold almost as quickly as offered. The plant cost in the neighborhood of $175,000.

The LETTER BOX

A Place Wherein Letters
That Have General Interest Are Published and
Commented Upon

More Light on the Rough Brick Situation

Those who have followed the "Letter Box" since the publication of Mr. Cuthbert's article on rough-face face-brick will be interested to know that the first service of this variety of face-brick has an honorable age. The following letter comes from J. C. Millin, of Johnsonburg, Pa., and bears date of March 18:

> In looking thru "Brick and Clay Record" I ran across an article or two in relation to the claims of those who believed themselves (or certain others) to be the first to make face-brick with a wire-cut face. I believe that I can say, without fear of contradiction, that W. H. Signor, of Ridgway, Pa., manufactured the earliest example of this kind of brick. At that time he was selling the product of the Ridgway Brick Company, and W. S. Ravenscroft was superintendent.
>
> Mr. Signor, during the winter of 1894 and 1895, was selling brick in and around Buffalo. In some way, he and Mr. Ravenscroft became acquainted and the two of them landed what we called the Laird job, or as it is better known, the Markeen apartment house, in Buffalo.
>
> The first story of this building is made of wire-cut-face face-brick and, if I remember correctly, they were set flat and flashed. The balance of the building was trimmed with the same brick. Or it may be that the brick that were to be used as trim, were set flat and flashed. This was done in the year 1895—twenty-one years ago.
>
> At that time, or immediately after, we sent out a number of samples of these brick to dealers, and called them "Markeen" brick.
>
> In 1900, or thereabouts, we began to manufacture our red brick with a wire-cut-face, and one job which I recollect, was sold by Mr. John H. Black, of Buffalo, N. Y., for a clubhouse in or near Erie, Pa. Possibly on account of this. we called the red brick with a wire-cut-face "Clubhouse." They were set flat and flashed.
>
> In 1903, a dealer came to our office in Ridgway, Pa., who had been in Mr. Black's office in Buffalo. and told us that he had seen a brick there that he would like to have for his own home. He was a lumber-man and lived in Saginaw, Mich. He looked over the little stock we had (probably four or five thousand, edge set) and said that they were just what he wanted. He wanted to know if we would make them for him, and we told him we certainly would. This job was also sold thru Mr. Black.

So far, the information elicited by the query, "Who Made the First Face-Brick with a Wire-Cut-Face?" has grown in interest. What other dates are available?

France Invites American Clay Products Exhibits

It is becoming more evident with each passing day that, when European rulers realize the folly of carrying on the present war and even before the formal pact of peace has been signed, there will be an attractive foreign market for domestic manufacturers of burned clay building materials. This feeling is spreading constantly and is growing stronger as the need for clay products in the belligerent nations across the water when the war is over, is becoming more apparent.

An interesting movement which fits in well with this belief, has taken the form of a reconstruction exposition to be held at Paris about the middle of May. Concerning this propaganda, Henry C. Long of Paris, France, writes as follows:

> I am enclosing a circluar which I trust you will find interesting.
>
> The day of the opening of the exhibit mentioned therein

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A Big Impressive Instrument

—made so sturdily that it resists rough handling.
—made so perfectly that it records perfectly year in, year out.
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—equipped with the largest recording dial in existence (in itself a guarantee against errors, for a small dial CANNOT record accurately).

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These locomotives are reliable, because they are correctly designed and built. They are economical, because they consume no fuel while standing idle.

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THE BALDWIN LOCOMOTIVE WORKS
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has been deferred to May 15. Orders have been given by the French government to the agents of the French Lines in New York and New Orleans to give preference to exposition goods during March and April. Any shipment made during that period will reach here in ample time.

The American Express Company, Adams Express Company or the Wells Fargo Express Company will take the exhibits of manufacturers anywhere in America and bring them into the exposition building without care on the part of the exhibitors, and return the goods if desired.

The clayworking plants of France and Belgium are so located that they are now in the hands of the Germans and are probably utterly destroyed.

The demand for brick and other clay products will be beyond the capacity of Europe when the war ends and this continent must look to America for help. Our people request of you that you make it known to your readers in every way possible to take advantage of this exposition and to exhibit all kinds of burned clay building materials.

Hundreds of plants must be built in Europe to supply the above mentioned demand. In fact we have requests for the price of building brickmaking establishments with a daily capacity of 25,000, so arranged as to be added to the old plants without disturbing their arrangement.

It is the greatest and best opportunity to American brickmaking and clay goods men that has ever been presented to get established in the foreign trade, especially in Europe. Representatives from the whole world are coming to France and all of Europe and the Mediterranean countries, as well as South America, will have buyers at this exposition."

The circular to which Mr. Long refers contains the details of the exposition, which has for its aim the education of engineers and the masses in the best way to rehabilitate destroyed villages and towns. This circular is much too large to describe at length, and for this reason the following extract is quoted which sums up in an able manner the underlying reasons for the exposition and its scope:

"Profoundly affected by the sufferings of our brothers in invaded territory and the pitiable condition of that part of our dear country, many of our fellow citizens are at the present time considering, as one of the essential elements of its restoration, the measures to be taken for the reconstruction of the destroyed towns and villages.

"The General Association of Municipal Hygienists and Technicians of France and French speaking countries are of the opinion that the time has now come to address an urgent appeal to the patriotism of all, in order to organize, at once, a special mobilization, entirely technical and industrial which will enable the cities and family dwelling places to be rebuilt.

"It appeared to the association that an exhibition embodying the indispensible elements for preparing and accelerating these reconstructions would be a valuable element of the action which is essential, and they have tried to organize it.

"This exhibition, the high patriotic importance of which cannot escape you, will open in May, 1916, on the Terrace of Tuilerie Gardens and in the Halls of the Jeu de Paume which the Minister of Arts has been kind enough to place at our disposal.

"The program is composed of four groups divided into twelve principal classes.

"In the first group will be found the essential organs of a modern town, the plans for arrangement and extension, plans for reconstruction, everything concerning the aesthetics and hygiene of a city, the precautions to be taken with a view to the absolute respect of local styles, the variety of which lends such charm to our French towns, the preservation of historic monuments and of any particularly beautiful natural sites, etc.

"The second group will contain buildings in general: public edifices, dwelling houses, rural and industrial constructions.

"In the third group will appear modern methods of and materials for construction, with examples of what has been achieved.

"Lastly, the fourth group will be specially devoted to legis-

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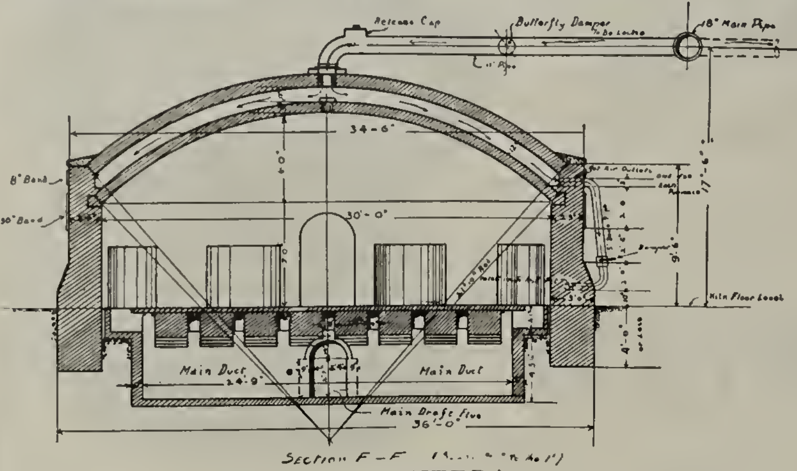

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It preserves the fire brick crown from rain and snow, and also provides a method of collecting the enormous amount of radiated heat and utilizing it.

Practically a perfect control of the fires is obtained, and a great saving in fuel and time accomplished.

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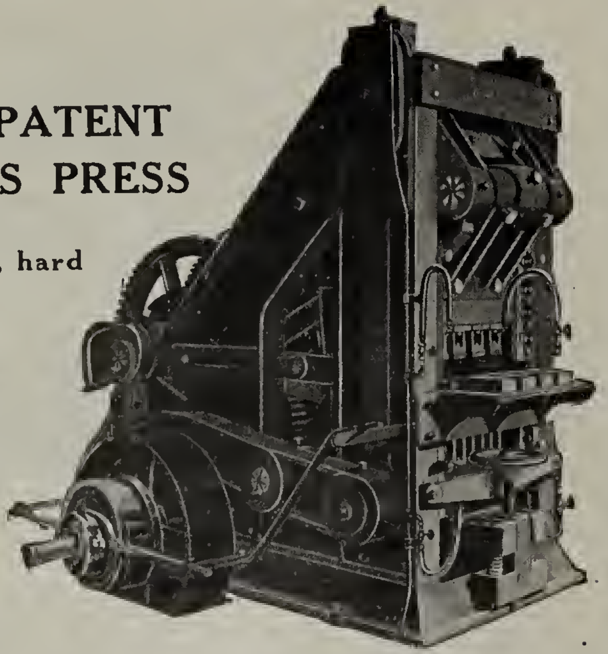

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lation governing the arrangement, the construction, the improvement and the beautifying of our cities.

"Congresses and numerous conferences will tend to spread knowledge of these essential elements of our national life.

"This important economic manifestation will show once more to neutrals and even to our enemies, that, confident of the final victory assured by her glorious army, industrial France is organizing herself in order to restore the ruins made by the barbarians, as soon as they cease to desecrate her soil, predestined for the development of Liberty, Justice and of Progress."

It would seem unnecessary to emphasize the importance of an exhibit at this exposition to the clay products manufacturers of the United States, especially those who are equipped to develop a foreign trade. The quantity of burned clay building materials that has been exported from this country in years past, has been comparatively small. Here is an opening which might easily lead to business that would swell this total by a large figure.

A Bricklayer Who "Boosts" Brick

Most bricklayers are willing to accept from sixty-five to seventy-five cents an hour so long as there is work to be had and contractors are willing to pay that price, but very few are inclined to spend even a small amount of time or energy, to say nothing of money, in promoting a more extended use of brick and thus making more work available, which would result in many benefits to the bricklaying trade as a whole. It is true that in many localities the bricklayers have been more than willing to do their share toward creating a better market for brick with the resulting increase in the number of jobs open to the tradesmen, but there is still considerable room for improvement in the attitude of most bricklayers towards the "boosting" of brick.

It is interesting to see what can be accomplished when a man, realizing that his welfare is involved in the choice of materials to be used in certain work, sets out with a determination to protect his interests. For this reason the following letter from H. C. F. Mandel of Huntingburg, Ind., is given below:

> I noticed your recent article on testing brick for sewers and being a bricklayer, I had to read it.
>
> If the brickmakers and bricklayers would get together more often they could do a lot of good for each other many times. For instance, a few years ago our city wanted to build a sewer in a certain street and had the specifications written for concrete only. I asked the city council to give our contracting firm a show at this work by letting us figure on a brick sewer. We said that we would guarantee the sewer to stand with a nine-inch brick arch, the sewer being in the form of a half circle with a diameter of seven feet at the bottom. We received a chance to bid on the work and got the job. It is in good shape today and will be for years to come.
>
> People will not build brick houses because they think it costs so much more than frame, so I started out talking brick veneer with the result that our company now builds three veneered houses where it erects but one frame dwelling. This helps the bricklayers and the brickmakers at the same time. Don't forget when you are talking to a friend or stranger who is a prospective builder to say before you part; "Build that house with BRICK."

It is often the case, when a brickmaker is endeavoring to "land" a job, especially on municipal work, that he advances the argument that brick should be the material used because it offers employment to home labor. This argument is just and reasonable, and has a sound economic basis.

Why should not the bricklayer reciprocate and advocate the use of brick at every opportunity in preference to other materials. Much can be accomplished by co-operation and there is no doubt but that, if the bricklayers and brickmakers would work closer together in this important matter, that it would be to their mutual benefit.

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Water, dust, oil, intermittent loads, sudden jerks, over loads—all—are detrimental to all belts — but—Hettrick belts due to the care in selection of canvas, care in manufacture, care in curing—processing—inspection — is the best belt for clay plants.

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You won't have to worry about competition if you treat your clay with

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You can safely guarantee that your brick will be

Scum-Proof

You can get a higher price and influence architects to specify your product because Efflorescence is prevented absolutely.

But insist on the R. H. BRAND—it's dependable.

We have a complete line of high grade chemicals for the clay industry.

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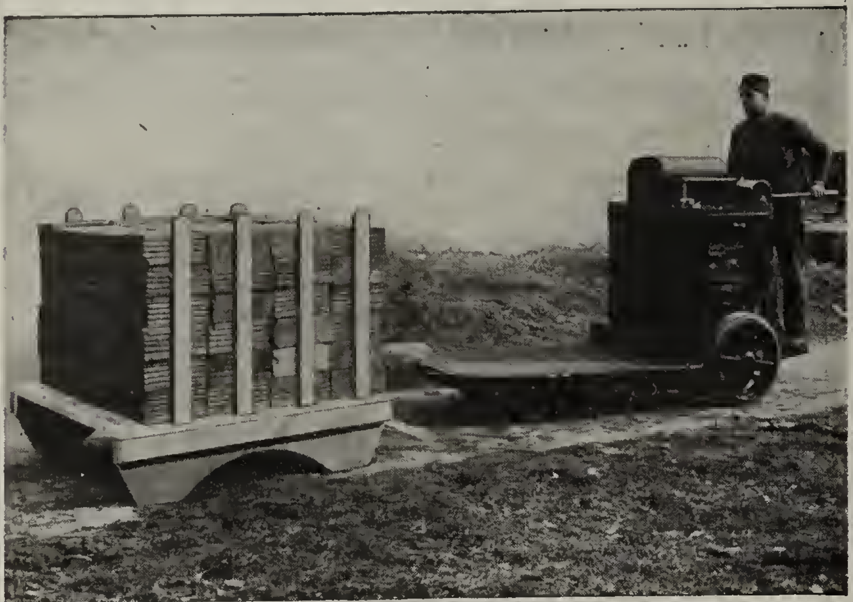

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He is no longer needed for this simple job.

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with one man, will successfully do the work of six men in most plants, handling clay products between presses, driers, kilns and yards or cars.

It will pay you to investigate—it has others.

THE ELWELL-PARKER ELECTRIC CO.
Main Office and Works CLEVELAND, OHIO

THWING HIGH RESISTANCE MULTIPLE RECORD PYROMETERS

Never Sleep

If the burner knows that his work is being

Recorded in Ink

every few minutes, he will stay **On the Job.**

Multiple Recorders reduce the cost of installation.

How Many Kilns Have You?

Thwing Instrument Company
437 North Fifth Street
Philadelphia

The Semi-Monthly Trade Review

As A RESULT of the rise in price of nearly all building materials, owners in many parts of the country have announced an intention to proceed no further with their plans until prices return to a normal level.

On the surface, it is easy to see why builders are taking this stand, but on a second thought, it does not seem reasonable that they should hold up all progress on their work because a comparison of existing prices and those which were in force a year ago, shows a favorable balance for the present levels from the clay products manufacturers' standpoint. Most builders fail to realize that the prices of a year ago were the lowest in several years, and that if a comparison in figures was made between 1916 and a period when building was entirely normal, it would be seen that the difference was not so great after all.

Structural steel is probably the greatest single factor in the rising tide of building costs. The price of brick, hollow-tile and other burned clay building materials has not made any large advance. There is no sound reason, therefore, why building should be stopped because of advances in those products—on the other hand there is every reason why more burned clay materials should be used because of the lower costs involved.

A review of nation-wide developments in building during the past two weeks shows a tendency to hold up operations, altho in many cities nothing seems to hinder the onward march of progress.

In Boston all building materials show activity, the movement having greatly expanded within the past few weeks. Philadelphia reports a fair amount of new building, but the advancing prices of materials, particularly steel, as well as a shortage of labor, is causing some proposed improvements to be held back.

BUILDING ACTIVE IN PITTSBURGH DISTRICT

Several good-sized projects, including the chamber of commerce building, contribute to a more favorable showing for March in Pittsburgh building permits, the total reaching $1,767,600 and comparing with $1,321,600 for February. Indications are that general contracting this summer will be better than the average. Thruout the Pittsburgh district, new enterprises are being established, particularly in the chemical industry, including the erection of many by-product coke plants. The high prices of building materials have a tendency to retard new construction work in Newark, N. J., while, on the other hand, building permits taken out in March in Buffalo, amount to $899,000, as against $830,000 for the same period in 1915.

From St. Louis the report comes that improvement in building operations has received a setback thru the steady advance in the cost of materials, but there is a large amount of work on contract that calls for brick. In Nashville, Tenn., there is considerable activity in building, several large structures being in the course of erection. Many residences will probably be built during the spring and summer on account of the large conflagration on March 22, the damage being estimated at over $1,000,000. The real estate market in Canton, Ohio, is quite active and a large amount of building is under way.

Brighter weather in Chicago has stimulated outdoor operations, especially heavy construction and new buildings for mercantile and factory purposes. Permits for business structures in Chicago for March had an aggregate value of $2,418,700, an increase over the same month last year of $1,045,500, or 76.1 per cent. All building permits for the week ending April 8 totaled $3,131,900 in value, compared with $1,377,100 for the corresponding week of 1915. Building operations of every kind and description in Detroit are increasing and numerous projects of more or less importance are contemplated and being arranged.

PACIFIC COAST SHOWS SIGNS OF NEW LIFE

On the Pacific Coast the outlook is very encouraging. Building figures in San Francisco show gains over a year ago, contrary to expectations, as much work was then being done in anticipation of the Exposition. Money continues plentiful, building loans in particular being offered at attractive rates. In Portland building operations are still restricted, but the March permits of $416,415 were larger than for any month this year, altho $100,585 under those of March, 1915.

MANY CONTRACTS LET IN THE EAST

However, more contracts have been awarded for construction in the eastern part of the country than in any first-quarter since 1909. In all states east of the Mississippi since January first, including New Jersey, New York, Pennsylvania and New England, there has been a gain of approximately one hundred per cent. this year over last. Construction contracts closed in the first quarter in New York state and the five New Jersey counties closely bordering New York city, total approximately $35,000,000. The total in figures for the eastern third of the country this year are as $300,000,000 is to $150,000,000, the former being the approximate total for the first quarter of 1916 just closed, and the latter being the approximate total for the same period in 1915.

The requisitions for building materials covering New York city and the surrounding territory, however, are decidedly out of proportion to the number of contracts reported. Protection orders feature this buying, dealers having covered themselves heavily so as to protect their customers in the long expected advance movement scheduled for the first of May.

During the last few weeks there have been signs in the New York wholesale building material market indicating lessening of the price pressure. Figuring upon an unprecedented scarcity of labor, the manufacturers began to prepare for protecting themselves against low supply and heavy demand. The first calls sent out for open-yard laborers by brickmakers to men who, during the winter, had taken jobs in munition factories, brought

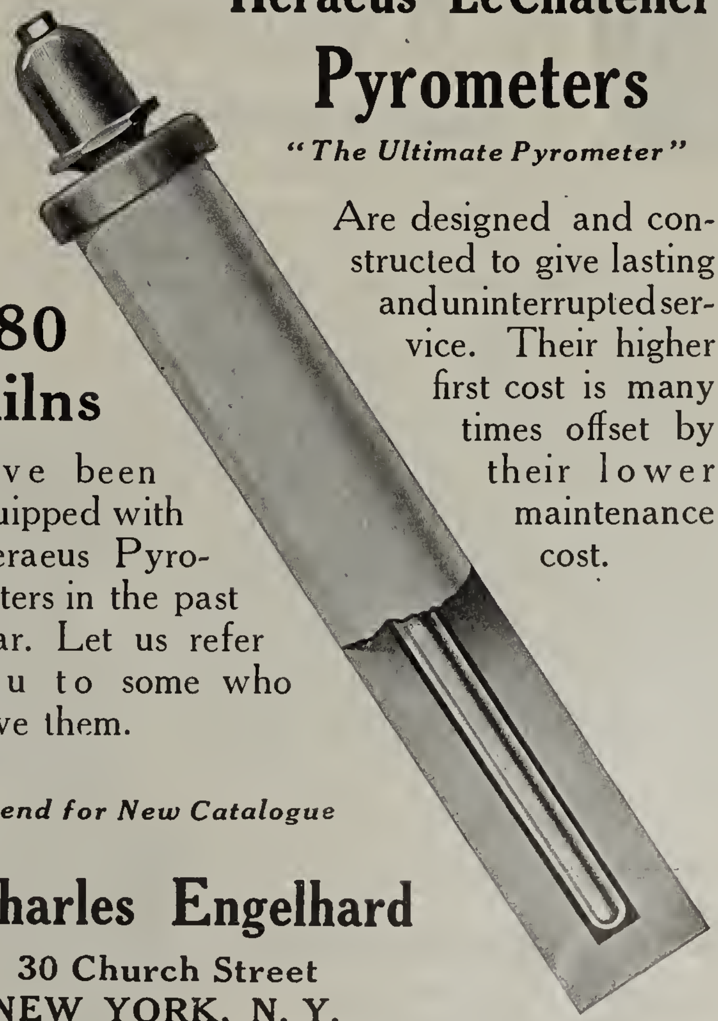
A New Sewer Pipe Truck

that is built in three different sizes:

No. 1. To handle 18"-20" and 24" pipe.
No. 2. To handle 27" and 30" pipe.
No. 3. To handle 33" and 36" pipe.

This Truck will be manufactured with the same care and skill shown in our Sewer Pipe Presses, Wheelbarrows, Dry Pans, etc. Send at once for descriptive matter.

The Toronto Foundry & Machine Co.
Toronto, Ohio



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Pyrometers
"The Ultimate Pyrometer"

Are designed and constructed to give lasting and uninterrupted service. Their higher first cost is many times offset by their lower maintenance cost.

180 Kilns have been equipped with Heraeus Pyrometers in the past year. Let us refer you to some who have them.

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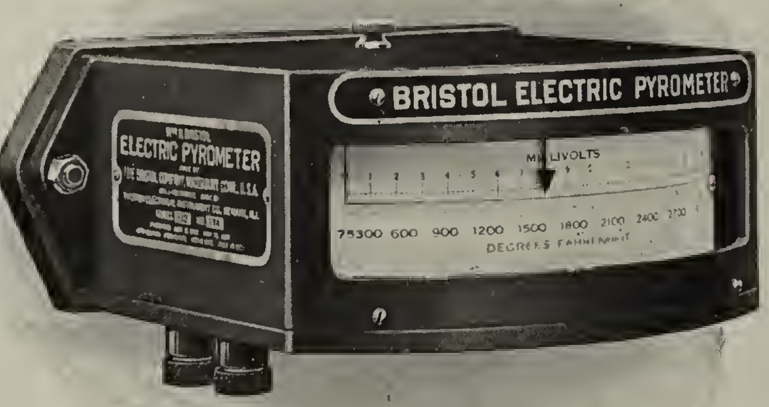
Charles Engelhard
30 Church Street
NEW YORK, N. Y.



BRISTOL'S HIGH RESISTANCE ELECTRIC PYROMETERS

EQUIPPED with high grade Weston milli-voltmeter movements with platinum platinum-rhodium couples for temperatures up to 3000 deg. F. The milli-voltmeter movement is of **pivot jewel-bearing type** which is comparatively rugged and especially adapted and used extensively to control kiln temperatures.

Write for Catalog 1400

THE BRISTOL CO., WATERBURY, CONN.

BRANCH OFFICES BOSTON CHICAGO PITTSBURGH NEW YORK SAN FRANCISCO

A bi-product that is profitable

Place the machine off in one corner of your plant, and let it absorb the spare time of your machine room men. They soon become expert, and a stock of flower pots quickly collects, ready for the kiln.

It is almost pure velvet—a bi-product—a sure seller with a manufacturing cost low enough to insure a goodly profit.

Send us sample of your clay and let us show you what our flower pot machine will do.

Baird Machine & Mfg. Co.
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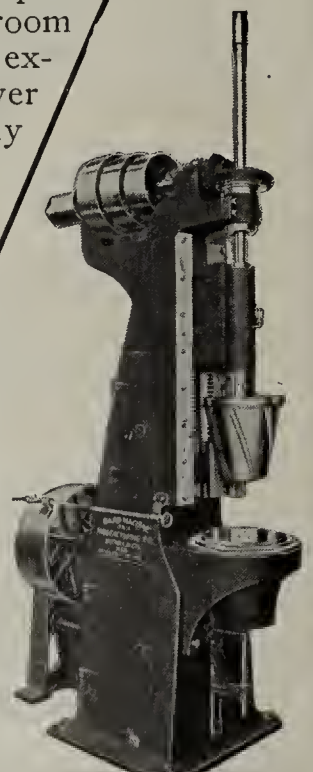


generous responses in the form of applications for regular jobs. The men, accustomed to work out-of-doors, chafed under the confinement of factory life, especially in the light of rumors of an early peace abroad. The scheduled advance in the price of Hudson common-brick from $8.50 to $8.75 at wholesale, New York, failed to materialize. Instead, it dropped back to $8.25 a thousand. Second-hand brick that was selling at $5.25 a load of 1,500 dropped back early in the week to $4.75 and $5.00 and, as the week closed, good cleaned brick were bringing only $4.25 and $4.50.

PRICE ADVANCES POSTPONED

Window glass which had been scheduled to advance by reduction of list discounts three weeks ago, is still in the same market with the promised advance indefinitely deferred. Structural steel which had been marked up to 3.669 cents a pound at tidewater, New York, is steady at that figure on domestic business, whereas it was promised that that level would be only temporarily held. More steel capacity is available for domestic structural orders. Fabricators are not having so much difficulty to get mill accommodation.

Portland cement has been on the verge of a general advance of five cents a barrel for several weeks, but general action by all companies has been postponed pending further developments in conditions at the mills regarding labor. Lime, that was scheduled to advance in the middle of March, has remained steady.

Crushed stone, building sand, gravel, timber, cut stone and grit are all in easier tones, as far as price stiffness is concerned. In commodities like brick, crushed stone, sand, gravel and grit, which are dependent upon barges for transportation, the prices are still inclined to be firm, owing to the heavy demand from railroads and other transportation companies for bottoms for handling of freight in the harbor. Barge rentals that normally are $6 now run as high as $12 a day.

Another factor that is bringing down the cost of many building materials is the loosening of embargoes by railroads. Vast quantities of materials have been stored in yards awaiting lighterage at a cost to either the producer or the purchaser amounting to a dollar a day per unit. This expense is clearing because the railroads have been refusing to accept freight for the metropolitan district until the terminals have been cleared.

FALSE ECONOMY TO DELAY BUILDING

The result of this change is that prospective builders will soon be encouraged to bring out their operations in larger measure. Conditions now seem to be working for greater stability to building material prices. There are indications that the peak of the recent price movement for building materials has been reached for the New York district, at least. Prospective builders will find conditions more favorable to prompt construction. But these conditions do not promise to endure permanently.

Mill supplies are short. It has been practically impossible to get prompt deliveries of new machinery or equipment to make repairs. This has been true of many brick plants in the East. There has been great difficulty in obtaining steel for making repairs, so that some plants will have their capacity reduced this summer.

This applies to the manufacturers supplying the New York market. Practically all the plants in that district will not be able to manufacture more than 900,000,000 common-brick this year, out of a normal production of 1,300,000,000, divided into 600,000,000 for the Hudson district and 300,000,000 for the Raritan river plants in the Perth Amboy district.

Builders who defer operations this year will probably have to pay much more for construction next year.

IN *the* WAKE *of the* NEWS

Being Brief Mention of a Host of Interesting Happenings in the Varied Fields of Clayworking

ARKANSAS

A rather poor demand, but with prospects excellent, is the report of the Dardanelle (Ark.) Brick and Manufacturing Company. This company recently installed a new up-draft kiln at its plant and has built a new clay shed. A system of burning coal in the kilns is being installed at this plant to replace fuel oil, the price of which is now too high for economic operation. The company reports that considerable new territory, in which to market its products, will be opened when the new railroad is built which will connect the Chicago, Rock Island and Pacific with the Fort Smith, Scranton and Eastern Railway. This new line will be completed in about six or eight months.

CALIFORNIA

Construction work has been started on the new plant of the Los Angeles Pressed Brick Company at Alberhill in San Diego county, Cal.

The plant of the Grant Brick and Tile Company at Santa Barbara, Cal., which has been closed for several years, is to be reopened this spring.

The Calexico (Cal.) Brick and Tile Company, which was recently taken over by Frank O'Byrne of Calipatria, Cal., looks forward to a busy season.

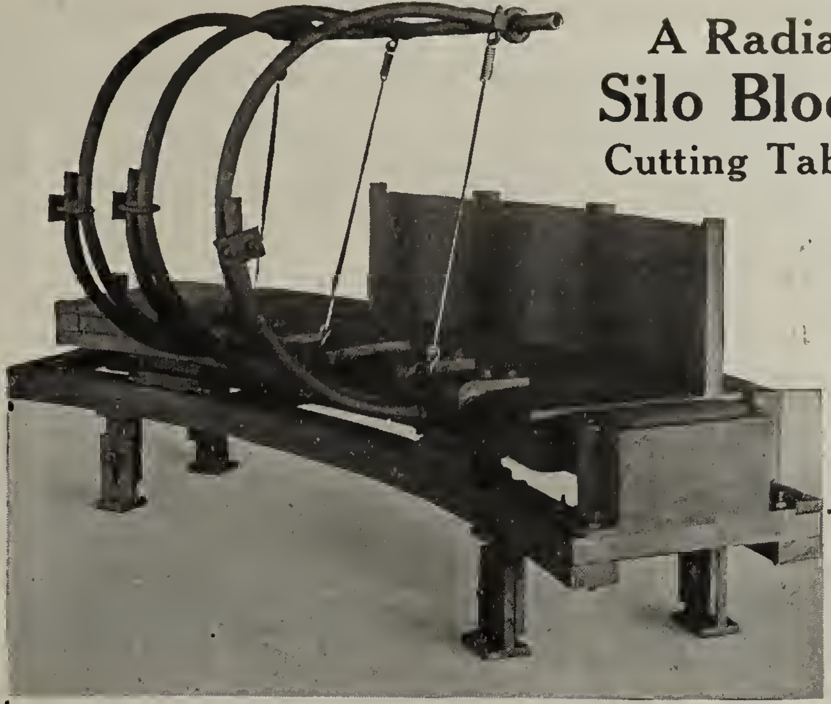
Permits for the construction of brick buildings in San Francisco, Cal., during the month of March were far larger than for any previous month in the past two years. The value of these buildings ranged close to one and a half million dollars.

The San Jose (Cal.) Brick Company will reopen its plant for the 1916 season on May 1 with large orders on hand, one of which calls for a million brick to be used in the erection of the Spreckels Sugar Refinery at Spreckels, Cal.

Kleiber and Company have made application to the Bureau of Building, San Francisco, Cal., for permission to construct a brickmaking plant at Folsom and Eleventh streets of that city. The plant is estimated to cost $23,000.

The Richmond (Cal.) Pressed Brick Company was recently given rail connections by the Nicholi Belt Railroad and, as a consequence, has ordered a doubling of its capacity since it is now able to ship in clay from the mountains. The first outgoing shipment made over the new road was an order for 80,000 brick to be used in the erection of the large plant of the General Roofing Manufacturing Company at Richmond.

The Long Beach (Cal.) Brick Company recently received an order for the brick to be used in the con-



A Radial Silo Block Cutting Table

The Farmers Are Building Clay Tile Silos

You hollow tile men! You can't afford to serve his needs—using old-time machinery or hand methods.

Hundreds of silos will be built—make the blocks on this cutter with a profit for your firm.

Use it in your silo season, store it in the off season—but you simply can't make as much profit without it as with it. One man runs it.

WRITE US TODAY—NOW
CRAWFORD & McCRIMMON CO.
Brazil, Indiana

We Are Doing It

Ask Us How—We can make you a saving of 25 to 50% in burning your clay products.

Ask Us How—We can burn your ware with a uniform hardness from top to bottom of kiln.

Ask Us How—We can turn a kiln of hollow ware each week.

Ask Us How—We can vitrify your brick from top to bottom of kiln.

The above results follow the installation of the:

Improved Hook Patent Up and Down Draft System

Can be built in round, or rectangular kilns, old or new, at a moderate expense.

For the above information address

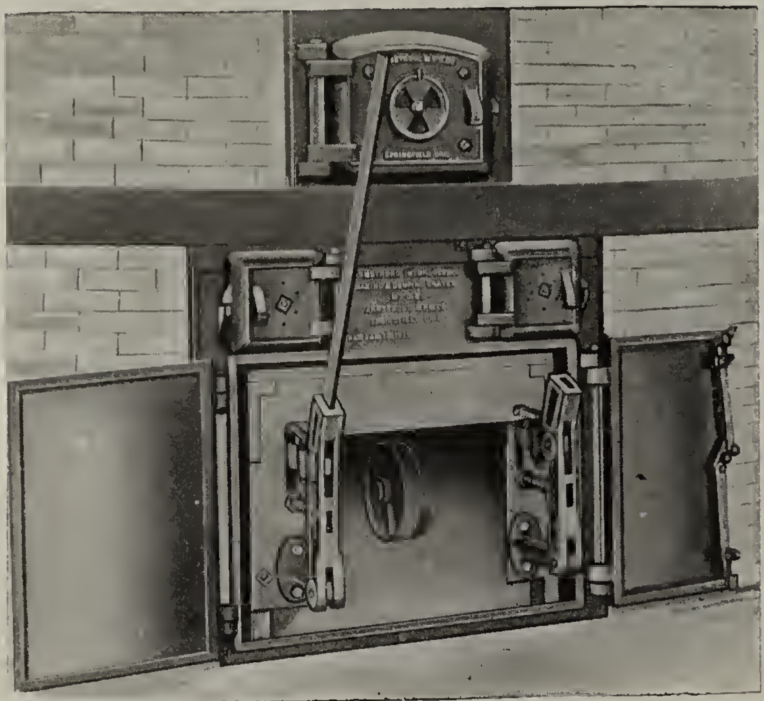
OHIO KILN COMPANY Vigo, Ohio

Armstrong Kiln Grates

Portable—Interlocking—Self-Contained
Shaking—Dumping

We will ship our Standard Interlocking Kiln Grate to any clay plant anywhere, install it at our own expense—if it is not satisfactory or does not give better service than any other kiln grate, we will remove it —and it won't cost you one cent.

It Will Positively Reduce Your Burning Costs.



We want to tell you more about these grates.

The Armstrong Manufacturing Co., Springfield, Ohio

POSTERETTES

200,000 of the "Build with Brick" posterettes have been used by brickmakers throughout the country. As many pieces of mail and express matter have carried the "Build with Brick" slogan to a vast army of prospective homebuilders.

Here is the second edition—the stamp advertising paving-brick. It tells a story that carries a moral —and that moral means better business for the men who make paving-brick.

How about using some of them—now?

Printed in THREE colors

Gummed and ready to stick on your letters, envelopes and packages.

$1.50 per thousand postpaid

Send your orders to

BRICK AND CLAY RECORD
445 PLYMOUTH COURT CHICAGO

struction of a modern hotel now being built in that city. About $12,000 worth of this material will be used. This order, together with two others, one of which calls for the re-fronting of a prominent theater and the other for some work to be done in the plant of the Diamond Match Company, is keeping the Long Beach Brick Company very busy.

The Pacific Sewer Pipe Company is preparing to enlarge its plant at Los Nietos, Cal., near Whittier, to provide capacity for the large number of orders it has been receiving recently. Seventy tons of sewer-pipe are now being manufactured daily, but when the proposed additions are made to the plant, the capacity will be doubled. To take care of this increased output, ten kilns will be added to those now in use, making a total of twenty-eight. Fifty-five men are now employed, but that number will be increased to more than one hundred. This company is just completing a shipment of one hundred cars of sewer-pipe of various sizes to the city of El Centro, in the Imperial Valley.

COLORADO

L. A. Copeland, president and general manager of the Golden (Colo.) Brick Company, is spending a few weeks in Salt Lake City, Utah, where his family resides. On April 4 he attended his daughter's wedding in that city.

The Denver (Colo.) Shale Brick Company is cleaning up its plant and preparing for a good season's run. Judging from the present outlook, 1916 will be a banner year. A full working force will soon be employed at this plant.

The rapidly increasing business of the Golden (Colo.) Enamel Brick Company has made larger quarters and a more advantageous shipping point imperative. Plans are being considered for moving the plant to Denver, which will provide a larger shipping radius.

IDAHO

The Heyburn (Idaho) Brick Company recently resumed operations and expects to work two shifts of men filling orders already on hand. A good-sized order has been received by this company for the brick to be used in the construction of a sugar factory at Twin Falls, Idaho.

A new brick plant has been started at Pocatello, Idaho. B. Cooper is manager of the company which is producing a soft-mud repressed brick. Mr. Cooper is an experienced clayworker and looks forward to a good business during the present year. The plant is located on a site consisting of eighty acres.

ILLINOIS

The plant of the Purington Paving Brick Company, located at Galesburg, Ill., resumed operations on April 3 with enough orders on hand to keep its force of six hundred men busy for several months to come.

On April 14 bids were received by the officials of the city of Ottawa, Ill. for the construction of 14,080 square yards of vitrified brick pavement. This city has had considerable experience with this type of pavement and has indicated a desire to continue its use.

The Illinois Brick Company, Chicago, reports that sales for the first three months of 1916 show a profit, compared to a loss for the same period last year. The company is negotiating for the sale of some land near Riverview Park, the proceeds of which may be diverted to the stockholders.

In digging the foundation for the buildings that were

to comprise the clayworking plant to be erected at Crete, Ill., by Fred H. Meier, formerly of St. Anne, it was found that the clay was not as desirable as the first test showed, due to the presence of a number of small pebbles. It is questionable whether Mr. Meier will continue the construction of the new plant.

The Streator (Ill.) Brick Company has installed a new machine to manufacture an entirely new rough-textured face-brick, which has been designed by that company. While the new brick has found great favor, no one as yet has been able to invent a name that adequately describes its appearance, and to stimulate interest in this direction, the company has offered a prize of $25.00 to the party suggesting a suitable name.

Since the Monmouth (Ill.) Clay Manufacturing Company was taken over by the James Greene and Sons Company last fall, the operation of the plant has been greatly retarded by the installation of new machinery and equipment. For the last few months the plant has been entirely out of operation. However, the period of reconstruction has now been brought to an end. The plant reopened on April 6 with a large number of orders on hand. Important among the improvements made are two new kilns, a storage shed with a capacity of several carloads and elevators, both for transporting the clay from the storage shed to the machine room and for carrying the ware from the driers to the kilns.

INDIANA

The Veedersburg (Ind.) Brick Company is operating its plant to capacity and looks forward to a satisfactory volume of business for the next few months.

The J. M. Leach Brick Company of Kokomo, Ind., is receiving orders for brick faster than it can fill them, this in spite of the fact that the plant is operating a day and night force consisting of about thirty men each. At a recent meeting between the employes in the machine room and the officers of the company, an increase in wages was granted to the former, practically re-establishing the rate that prevailed before a slight cut which was made last spring.

Business continues good with the Brooklyn (Ind.) Brick Company, according to its secretary-treasurer, W. R. McKown, of Indianapolis, who says that he feels the company is getting its share of the present demand. The plant has started the shipment of more than two million brick to Bloomington, Ind., to be used in the construction of a new gymnasium at the University of Indiana. The company is also shipping about twelve carloads of brick to Plainfield, Ind., for use in the erection of an addition to the Indiana Boys' Reform School.

Sewer-pipe prices have advanced about twenty per cent. in the past few weeks, according to J. H. Zinn of the Wm. E. Dee Clay Manufacturing Company, with plants at Mecca and Newport, Ind. Mr. Zinn says that it has been rumored that manufacturers are curtailing their output in order to regulate the price, but, so far as he knows, there is no foundation for the report. He says that recent rises in price are due to the increased cost of labor. Mr. Zinn finds that the demand for brick, so far this season, is about fifty per cent. better than it was at this time last year.

KENTUCKY

It is rumored that at Mt. Sterling, Ky., the city council is considering repaving several of the old brick streets and sidewalks.

"NATCO'S" Way is to get the clay for their famous Hollow-Tile with Marion Steam Shovels. "Natco" has had plenty of opportunities for testing "Marions." The first purchase was made many years ago; now they have half-a-dozen "Marions."

Low Operating Cost, Large Capacity, Few Repairs Needed are some of the reasons this customer has given for making "Marions" his choice. Yet there's nothing "special" about the Shovels we make for "Natco."

You might find it profitable to do *your* digging with a "Marion," too. Why not write us now, without obligation, for particulars?

Marion

We Make Excavating Machinery of Every Description

Branches:
Atlanta, Chicago, New York, San Francisco, Seattle

THE MARION STEAM SHOVEL COMPANY

Established 1884 MARION, OHIO

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Your Ware Is As Good As You Make It!

To make a merchantable class of ware it devolves upon you to perfect each single phase of the manufacture—from the selection of the clays to the sorting of the finished product.

The correct measuring and mixing of two or more raw clays is of tremendous importance.

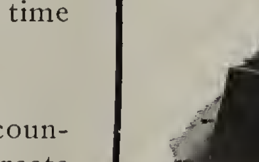
Financial success or financial failure depends upon the ability of your men or machines to standardize the batch.

To depend on your men to measure, to guess, to mix with shovel—or slide gate and chute is to have the batch run wild.

A dependable machine is your only alternative, and that machine is the Schultz proportioner—it measures, mixes and tempers. Set it and leave it. It does its work well.

Get details from

A. L. Schultz & Son
Clay Plant Engineers
1675 Elston Ave.
Chicago



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The arrangement of the Heating System in a drier has much to do with the drier's success with different varieties of clays.

One big feature of The Standard Heating System is its **extreme flexibility of arrangement,** which makes it adaptable for the drying of **all varieties** of clays.

The Standard Heating System can always be arranged to suit the special requirements of any clay, and to meet any steam conditions.

This is an interesting phase of the brick drier proposition—one that it will pay you to consider. We shall be glad to send you complete information.

Write for our catalog, which tells all about The Standard Natural Draft Steam Drier. Address: The Standard Dry Kiln Co., 1540 McCarty St., Indianapolis, Ind.

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There is a man—

a manufacturer of fireclay products; he has used Canton Kiln Grates for four years.

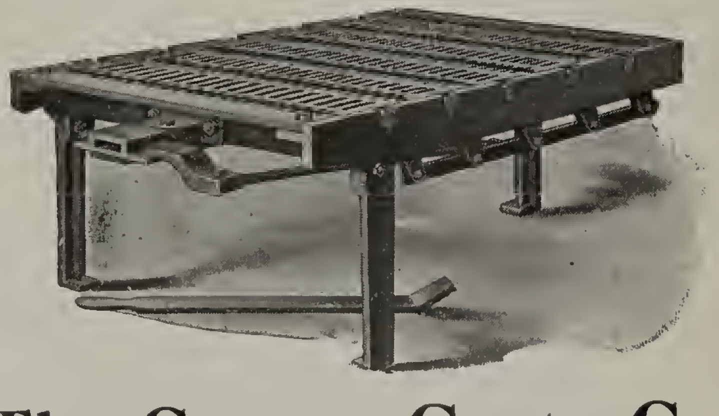
This man saved 30% of his burning costs each year in the first three years.

Today, in the fourth year, he claims and is accomplishing a saving of—40%.

Are you neglecting an opportunity? In all fairness to yourself, to your trust, to your company—is it right for you to any longer neglect an investigation of Canton Kiln Grates?

We have dozens of sets in kilns. We will furnish you a set on a trial basis.

Write that letter to us—now.



The Canton Grate Co.
1706 Woodland Ave.
CANTON OHIO

The city council of Versailles, Ky., has instructed Mayor Taylor to secure an estimate on the cost of paving Main street with vitrified brick.

The F. T. Justice Company, Lexington, Ky., dealers in building supplies, has purchased eleven and one-half acres of land and is preparing to erect a modern plant with trackage and other facilities.

J. Snyder of Nicholasville, Ky., was recently in Irvine, Ky., where he looked over the field with a view to starting a new brick plant. Irvine is a "boom" city on account of the heavy petroleum operations which have been started in that vicinity during the past few weeks.

With two million common and face-brick sold, the Hillenbrand Brick Manufacturing Company, Louisville, Ky., is operating to full capacity in order to get some stock ahead. The company has about a million and a half brick on hand at this time, but expects to be rushed for the next five or six months.

Following the installation of new machinery recently at the plant of the Paducah (Ky.) Clay Company, the capital stock of that company was increased from $12,000 to $100,000. The company is operating a clay mine near Briensburg, in Marshall county, which is said to contain rich deposits.

Deliveries are about normal for this time of year, according to L. M. Parsons of the Tyler Building Supply Company, Louisville, Ky. Most of the business now being handled is on small orders for residences, but the company is feeling optimistic over developments, as several large contracts are in sight.

J. H. Bells, salesmanager of the Louisville (Ky.) Fire Brick Company, reports that orders received during March broke all previous records. The capacity of the plant at Grahn, Ky., is to be enlarged from 33,000 to 45,000 brick a day. The Louisville plant is operating full time. Orders have been booked for months ahead.

At Hazel, Ky., work has started on developing the clay deposit recently discovered on the farm of Reed Byrd. A number of Paducah (Ky.) citizens have organized the Babb, Jennings and Lindsey Clay Company, and have made arrangements for developing the deposit. Mr. Byrd will be superintendent. Sheds will be built at Hazel for storing and shipping the clay. It is planned to build a spur track into the clay field.

P. M. Crane of the East End Brick Company, Louisville, Ky., reports that the plant is closed now awaiting the completion of arrangements whereby a supply of clay may be acquired in order to resume operations. The company worked out its pit eighteen months ago and has been forced to haul its clay from an outside source since that time. A fair stock of brick is still on hand and small deliveries are being made.

Louisville (Ky.) brick manufacturers and building supply concerns were somewhat surprised at the excellent showing made in building during March. According to the latest report of the building inspector's office there were 304 permits issued during the month totaling $576,730. This report showed eleven more buildings projected than during the same period last year, with an increase in value of permits amounting to $58,630.

Most of the machinery of the old Hydraulic Brick Company, Louisville, Ky., has been dismantled and sold, according to A. J. Jungerman, president of the company. The hydraulic press and several of the kilns are still standing. A part of the property has been cut up into building lots and the company expects to clear the balance of the land for building purposes inside of the next few weeks. This marks the passing of one of the oldest and largest concerns in the city.

There has been a general improvement in the Louisville (Ky.) brick business during the past few weeks. The demand for face-brick is a little quiet, but all of the manufacturers of common-brick report good orders. Many small orders for the better grade of face-brick are being received for residence work. Local plants are working full time. In nearly all cases the managers report that they have business enough booked to keep them busy for several weeks.

The most interesting building prospect in Louisville from the brickmaker's standpoint at the present time is the new auditorium which will be erected shortly. A fund of about $300,000 was raised recently thru public subscription of stock and donations. Twenty-five sites for the building have been proposed but this list will be cut to five. The stockholders of the organization will then decide just where the building will be erected. Plans are being completed and contracts will probably be let during the next sixty days. The building will involve one of the largest contracts of the year.

Fire-brick plants in Kentucky and vicinity have been literally swamped with orders for several months on account of the large operations of the steel and iron smelters and zinc operators. The Louisville Fire Brick Company has just received an order for twelve cars of brick to be used by an independent company at Panama. J. H. Bell, salesmanager, reports that the company submitted bids on all of the Government requirements consisting of standard and special size brick. The company hopes to land this contract which will be for about three-quarters of a million brick. Both the Louisville and the Grahn (Ky.) plants are operating to full capacity, and are behind on orders, having had to refuse some business. Plans are about completed for the improvements to be made at the Grahn plant, which will be enlarged considerably.

MAINE

J. B. Morin has leased the so-called Oliver Brick Yards at Danville Junction, Maine, and is making plans to start work at an early date.

MASSACHUSETTS

Stocks at the plants in the vicinity of Springfield, Mass., have already been sold, and an extremely busy year is anticipated as a consequence. Altho weather conditions have not permitted a reopening, the demand for brick is very strong.

Chas. F. Washburn of Everett, Mass., a member of the firm of D. Washburn and Sons, proprietors of a large brick plant at South Everett, died at his home in that city on March 14th. Mr. Washburn was prominent in the affairs of the city and has been a member of the board of aldermen.

Brick plants in western Massachusetts are already making plans for a busy season. Manufacturers are predicting a labor scarcity, and men experienced in the manufacture of brick are finding little difficulty in securing places at good wages. The stocks at most of the plants have been long since exhausted, which means that if the demand continues anywhere near as well as it has in the

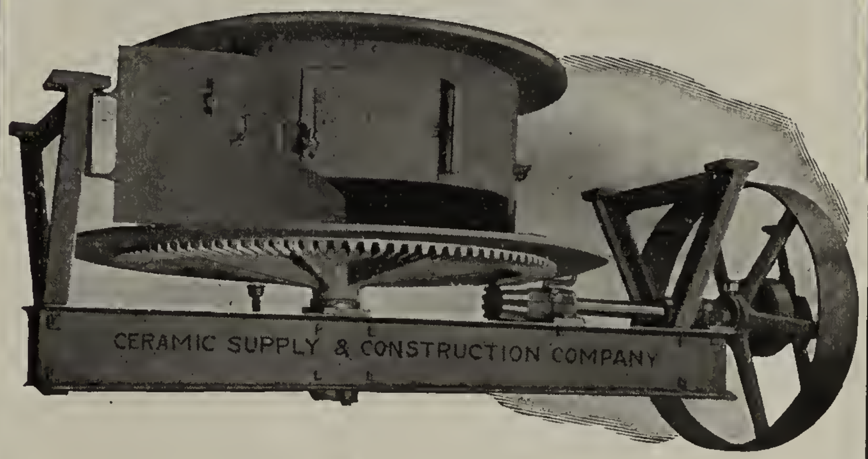
"CONTINENTAL"
BRICK BARROW

Correctly designed and perfectly balanced.
Built of No. 1 Air Seasoned Southern White Oak.
Rigidly re-enforced, and built for service.
Large wide tired wheels—steel or cast iron.
Babbitted Malleable Bearings—self oiling and dust proof.

SPECIAL "HYATT" ROLLER BEARINGS IF DESIRED

Just the barrow you are looking for.
What is the nature of your requirements?

CONTINENTAL CAR COMPANY, Inc.
PIERCE BLDG., ST. LOUIS, MO.
WORKS: LOUISVILLE, KENTUCKY



"Bolt It to the Bin"

The Columbus Feeder

for automatically feeding

Crushed Clay to Dry Pans *and* Pulverized Clay to Pug Mills

is fast coming into general use. There's a reason. Let us show you—furnish the machine on trial.

Send for Circular.

Ceramic Supply & Construction Co.
Columbus, Ohio

Think of This!

A 22-Foot Kiln Has Been Burned in as Low as 26 Hours, with a Fuel Consumption of Only Six Tons of Coal—This Includes the Watersmoking and High Fire Periods Too!

This time is exceptional, of course. It's quite the rule, however, to burn this size of kiln with six tons of coal in from 30 to 36 hours, in different plants equipped with the

Hook Patent System of Kiln Burning

It long ago passed the experimental stage—in scores of plants making brick, tile and other clay products it has proven its efficiency.

It's impossible to tell you much about this remarkably successful system in this space—but if you'll just ask us, we'll send you full details, facts and figures to convince you that we can cut your burning costs and increase your dividends.

HOOK PATENT KILN CO.
VIGO, OHIO
Canadian Office: 250 Dufferin St., Toronto, Ont.

past, the plants in this section of the country will operate to capacity well into the fall.

MICHIGAN

The Muskegon Brick and Tile Company of Fruitport, Mich., has been incorporated with a capital stock of $10,000, of which $6,000 has already been subscribed and $2,000 paid in in cash. The principal stockholders are Frank E. Handerhaden of Holton, and William T. Buck and John Mullen of Muskegon.

Several new office buildings, consisting of twenty stories or more, will probably be erected in Detroit in the very near future. James Couzens, president of the Highland Park State bank, and formerly general manager of the Ford Motor Company, will erect a twenty-two story building at Fort and Shelby streets, which will be of brick and steel, with a white terra-cotta front. The Buhl Land Company will erect a large office building at Griswold and Congress streets, to be of brick and steel. The Masonic Temple has purchased property on Bagg street and will erect a million dollar home that will be of brick and steel. The Cadillac Motor Car Company will spend about $2,000,000 on a complete new factory that will contain considerable brick.

MINNESOTA

George Madsen, formerly connected with the Hutchinson (Minn.) Brick and Tile Company, has accepted a position with the Minneapolis Clay Products Company as foreman of its plant in North Minneapolis. Accompanying him in this change was his brother, Carlisle Madsen, who will be employed as a drainage engineer by the above company.

The Minnesota Brick Company of Minneapolis, Minn., was recently granted a thirty-year lease to Columbia street and Thirty-first avenue in that city by the municipal committee on roads and bridges. This lease has been sought for some time but opposition on the part of the citizens delayed its acquisition. The leased streets will be used for trackage purposes in connection with the new plant which this company is building.

MISSISSIPPI

The Improved Brick and Stone Company of Meridian, Miss., is a new concern incorporated with a capital stock of $50,000 to manufacture brick. The plant, which is to be built at Meridian, will have a daily capacity of 20,000 brick. The headquarters of this company have been moved to Meridian from Byhalia, Miss. W. L. Sanderson is president of the concern and has offices in the Masonic Temple Building.

MISSOURI

The Brick Manufacturers' Association of St. Louis, Mo., has recently moved into its new headquarters in the Wright building of that city.

The Missouri Brick and Tile Company, Kansas City, Mo., has been incorporated with a capital stock of $200,000 to manufacture brick and tile, and to mine clays. Phil R. Toll, Louis L. Seibel and Alfred Toll are the incorporators.

MONTANA

The new brick plant of the Anaconda (Mont.) Copper Mining Company was recently damaged by fire. The building loss is reported to total $5,000, while the machinery, just recently installed, is a complete loss.

NEBRASKA

The partnership formerly existing between Emil Polenski, Doede Smith and William S. Shellak, under which the Hastings (Neb.) Brick Works has operated, is dissolved by the withdrawal of Doede Smith and the death of William S. Shellak. Emil Polenski will continue to operate the plant.

NEW JERSEY

The American Enameled Brick Company, whose plant is at South River, N. J., recently secured, thru its New England representatives, several large orders. Among these is one for supplying brick to be used in the erection of a new office building which is to be reconstructed from the old Nottingham Hotel, Copley Square, Boston, Mass.

NEW YORK

The installation of additional pallet racks in the open-air drying system on the soft-mud brick plant operated by Percival Goldin and Son at Catskill, N. Y., will largely increase its drying capacity.

The Kelly-Steck Clay Products Company, New York, N. Y., is the name of a newly organized company which has been incorporated with a capital stock of $100,000 to manufacture clay products.

NORTH CAROLINA

The Mo Ho Brick Company has been incorporated at Mount Holy, N. C., with a capital stock of $15,000 to manufacture brick. The incorporators of this company are George D. Jenkins of Mount Holy, J. H. Walters of Gastonia, and J. S. Hoffman of Charlotte.

NORTH DAKOTA

The Dickinson (N. D.) Fire and Pressed Brick Company is enjoying a large amount of business at the present time, with a bright outlook for the coming season.

It is rumored that a brick plant will be erected at Beulah, N. D. during the coming summer, by the Black Diamond Coal Company. Tests that have been made of the clay available have proved satisfactory and the market is apparently a good one.

OHIO

The plant of the Bloomdale (Ohio) Tile and Brick Company, which was recently purchased by C. C. Fries, was taken over by him on April 1.

William J. Wales, a veteran brick manufacturer of Painesville, Ohio, died at his home in that city on March 25, from illness brought on by old age. Mr. Wales was 86 years of age.

The Cincinnati (Ohio) Clay Products and Supply Company is preparing to deliver shipments of brick at a comparatively early date to the Ferro-Concrete Construction Company for the new Eastern high school.

The Waynesfield (Ohio) Drain Tile Company has been incorporated with a capital stock of $40,000 to manufacture drain-tile. The incorporators of this company are: J. W. Allen, B. L. Schultz, Elsie P. Schultz, G. W. Bailey and Flo Bailey.

Six kilns on the plant of the Conneaut (Ohio) Brick Company, containing several thousand unburned brick, were damaged and their contents destroyed, when they were flooded by the waters of Conneaut creek which began to rise on March 27.

The Medal Paving Brick Company of Wooster, Ohio, successors to the Wooster Shale Brick Company, announces that its plant at that point will be rebuilt this

Bucyrus-Westinghouse Electric Dragline Excavator at Plant of Cherokee Brick Co., Macon, Ga.

Westinghouse
Electric-Driven Shovels

do everything steam shovels can do, and

Do It Better

Why bother with coal, service pipes, water supply and other inconveniences common to all steam-driven shovels, when you can do away with them by using electric-driven shovels?

Westinghouse Electric-Driven Shovels are always ready for work at a minute's notice; require no licensed engineer; are most economical to maintain and operate; have no standby losses.

The Westinghouse Motor and Control equipment is specially designed for the service, and is so simple and reliable that anyone of ordinary intelligence quickly becomes an expert operator.

Ask our nearest office to send you Descriptive Leaflet No. 3710; it gives some interesting particulars.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.
Sales Offices in All Large American Cities

271

RADFORD'S BRICK HOUSES AND HOW TO BUILD THEM

is a book every brick-maker should have

Your responsibility does not end with the turning out of a first class brick. You should know how to use your brick to show it off to the best advantage.

This book is a complete and clear manual of brick construction, designs and details. It tells what every builder should know of the classification and measurements of brick work, together with architect's drawings of framing for brick houses and the use of brick veneer.

It also tells of the miscellaneous uses of brick, including ornamental brick and tile work, chimney and flue construction, brick fireplaces, brick sewers, cisterns and flush tanks, etc. It tells the builder everything he should know to undertake brickwork and it is so clearly illustrated by details that there can be no uncertainty as to each successive step to be taken.

The designs in this book alone are worth the price.

GET ONE NOW

Price $1.00

Book Department

Brick and Clay Record

CHICAGO

coming fall and the capacity doubled by the addition of nine kilns and other equipment.

The Mohr-Minton brick plant at McArthur, Ohio, is to be placed in operation as soon as possible, according to a statement from the company. A force of men has been put to work repairing the equipment and cleaning up the yards. The prospective activity in the building field has led to this move, as indications are that there will be a good market for brick.

A change in the officers of the recently incorporated Coshocton (Ohio) Brick Company has resulted in the following being elected: R. M. Love, president; J. D. Severn, vice-president; M. D. Custer, secretary, and A. W. Holmes, treasurer and general manager. Besides these men, the board of directors includes L. P. Gallagher, B. F. Cotter and John B. Hay.

The chamber of commerce of Massillon, Ohio, has divided itself into ten teams to sell $90,000 worth of stock for the Massillon China Company, which will locate at that point provided the above amount of stock can be sold to local investors. The company will be incorporated with a capital stock of $200,000, and of this amount, $110,000 is to be invested by those in charge of the concern.

W. S. Townend, formerly an Ohio clayworker, has laid plans for the manufacture of sewer-pipe and fire-brick from the molten lava of the active volcano, Kilauheau, a famous attraction for tourists on the island of Hawaii. Bucket elevators, capable of withstanding a temperature of 2,000 degrees Fahr., will be used to "win the lava" from the crater of the volcano. The material will be formed into the desired shapes by means of molds.

W. H. Gifford, general manager of the Cleveland (Ohio) Builders' Supply Company, states that the figures covering the sales of his company for February, March and April of this year will be the largest in the history of the company for corresponding periods. "In fact," he says, "from the way business has started, 1916 will go down on record as the biggest year for the brick and allied industries that Cleveland has ever seen; and we thought 1915 was a wonder."

The Ohio state highway department is preparing to let contracts for a large amount of brick paving to be built early this year. Several miles in the vicinity of Canton, and between Canton and Akron, are scheduled for an early completion. Motorists have been untiring in their efforts to secure the construction of this pavement, and the decision of the state to use brick on these much-traveled highways, has been greeted with considerable enthusiasm.

The Conard-Hallwood Brick and Tile Company has been incorporated at Columbus, Ohio, with a capital stock of $15,000, for the purpose of manufacturing brick and hollow-tile. The incorporators and officers of the company are as follows: John A. Conard, manager; H. S. Hallwood, president; John W. Wilson, vice-president; John B. Conard, secretary; Harold Hallwood, assistant treasurer; Henry S. Hallwood and Annie Hallwood. Good railroad connections and a high grade of shale should make this plant a profitable enterprise. The capacity will be 25,000 brick and tile per day, that figure to be increased to 100,000 just as soon as operations get under way.

Plans are under way at the Ohio state brick plant at Junction City to materially increase the number of men engaged in the work. About fifty men are now working at the plant. With the arrival of spring weather the prison board plans to place the plant in full operation to compete for the brick to be used in the large amount of building planned for this summer. Opposition on the part of manufacturers to the production of paving-brick by convicts has been successful in virtually eliminating the product from the field, but those in charge seem to think that there is no objection to the manufacture of brick for other purposes. It is, therefore, probable that a large quantity of this ware from the Junction City plant will be used during the summer in the construction of state buildings, notably six large hospitals in various parts of Ohio.

PENNSYLVANIA

At the plant of the C. P. Mayer Brick Company, Bridgeville, Pa., Dominick Meali, foreman of the clay bank crew, was seriously injured recently when he poured black powder into an eighteen foot hole that had been sprung for a charge, without giving the pocket time to cool. Possible loss of sight and a number of scars will result from this accident.

The large plant of the Wilkes-Barre and Hazelton Brick Company, recently constructed at Hazelton, Pa., will soon be put in operation. The plant has been designed for a daily capacity of 100,000 brick and has been incorporated with a capital stock of $150,000. Thirty-five men, including officers and directors of the company, recently visited the plant on an inspection trip.

RHODE ISLAND

Workmen have been engaged for some time making repairs at the plant of the Ashaway (R. I.) Clay Works, in preparation for the spring opening. Some new machinery is being installed and the plant is being put in a first-class condition.

The plant of the Barrington (R. I.) Steam Brick Company, which was recently damaged by fire, is to be rebuilt immediately, according to the decision reached by the officials of the company at a meeting in Providence held early this month.

SOUTH DAKOTA

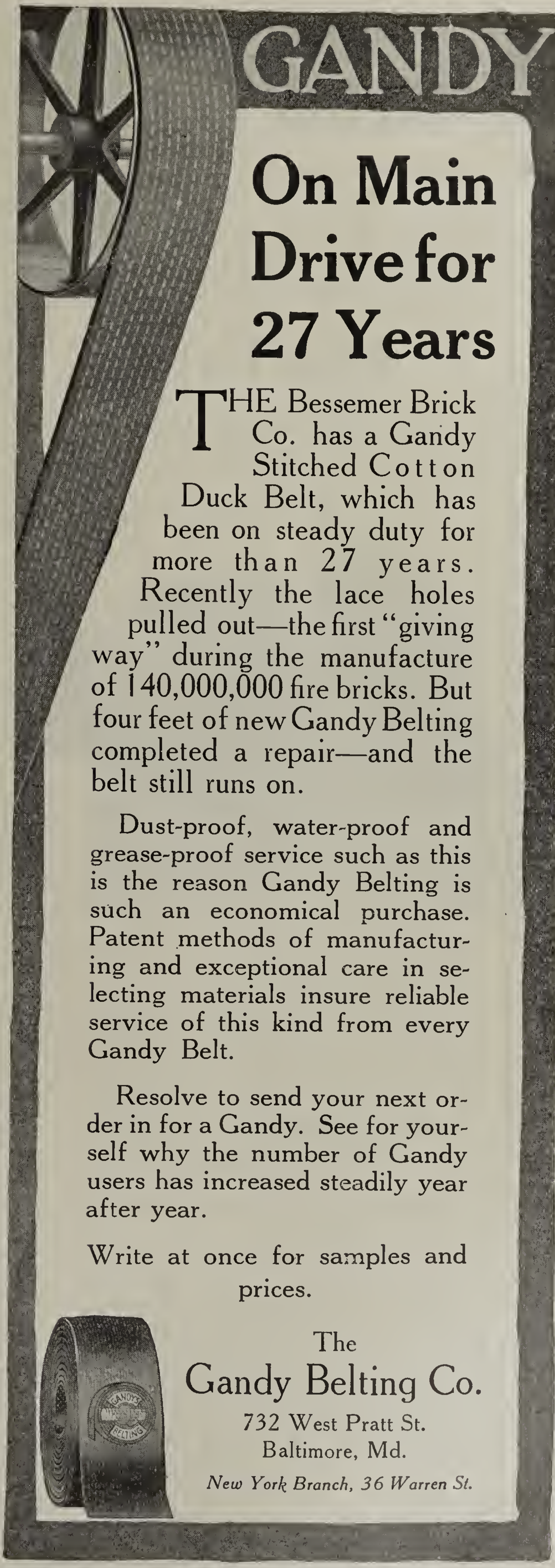
E. C. Klopping, formerly manager of the Yankton (S. D.) Brick and Tile Company, recently disposed of his holdings in that concern to R. J. Mahaffy of Broadland, S. D. In return Mr. Klopping received a well-improved ranch where he will engage in the live-stock business. W. J. Rossman of Huron, S. D., has also purchased a substantial interest in the company and will succeed Mr. Klopping as manager. A very healthy future is assured the plant under the new management.

TENNESSEE

The Key-James Brick Company of Chattanooga, Tenn., recently secured an order for the brick to be used in the construction of the Elkins office building at Atlanta, Ga.

The Fulcher Brick Company of Nashville, Tenn., is doing a large amount of business and prospects are bright for a continuation of this activity thruout the year. Important among the contracts received recently are those for the brick to be used for the erection of the Castle Heights school at Lebanon and for a three-story apartment building in that city.

The Bristol (Tenn.) Brick Company's plant will again be put in operation according to a decision reached at a meeting of stockholders recently when W. R. White was elected president of the company. It is only a few months since the company built a number of new round down-


GANDY

On Main Drive for 27 Years

THE Bessemer Brick Co. has a Gandy Stitched Cotton Duck Belt, which has been on steady duty for more than 27 years. Recently the lace holes pulled out—the first "giving way" during the manufacture of 140,000,000 fire bricks. But four feet of new Gandy Belting completed a repair—and the belt still runs on.

Dust-proof, water-proof and grease-proof service such as this is the reason Gandy Belting is such an economical purchase. Patent methods of manufacturing and exceptional care in selecting materials insure reliable service of this kind from every Gandy Belt.

Resolve to send your next order in for a Gandy. See for yourself why the number of Gandy users has increased steadily year after year.

Write at once for samples and prices.

The
Gandy Belting Co.
732 West Pratt St.
Baltimore, Md.
New York Branch, 36 Warren St.

Here's a Disintegrator for Small-Yard Capacity that is Unequaled

This disintegrator is built on the same lines as our No. 1 Disintegrator, only smaller.

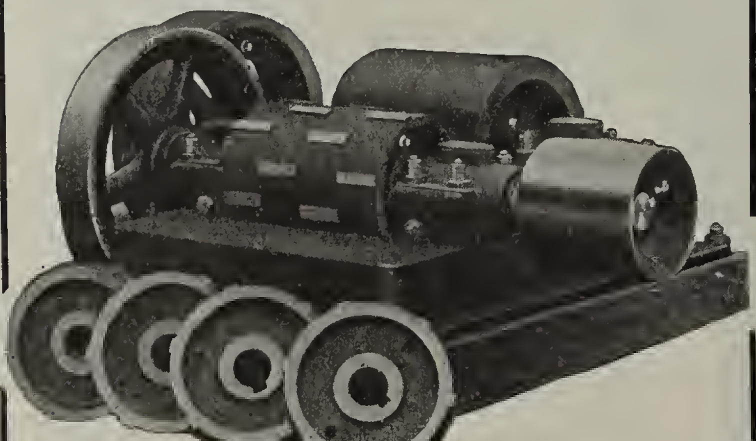
It will thoroughly prepare 7 to 14 tons of clay per hour, shredding and separating the clay, leaving it in a loose, open condition to absorb water rapidly when being worked in the pug mill, and pulverizes the small stone and separates the larger ones.

The Fate

No. 2 Disintegrator

This machine is installed in clay plants in practically every state in the Union and has given full satisfaction in every case.

Note these Specifications



No. 2 Disintegrator—Interior View

The picture above shows the interior construction of the Fate No. 2 Disintegrator.

The speed roll is composed of four chilled iron sections (see illustration), these having lugs or teeth set alternately one with the other.

By this construction the clay is taken gradually, giving evenness of motion.

The sections are keyed onto a large shaft in such a manner they are interchangeable and reversible and when one cutting edge becomes worn may be reversed and an entire new cutting service presented to the material.

Let Us Quote You a Price F. O. B. Your City

Suppose you let us quote you a price on this No. 2 Disintegrator delivered to your plant ready for service.

You understand, of course, that we make disintegrators and pulverizers of various sizes and capacities.

Send For Fate Catalogue

The Fate Catalogue gives pictorial demonstration of the entire Fate line of clay-working machinery. Indicate on coupon to left what particular item you are interested in and special descriptive literature will be sent you on that.

The J. D. Fate Co.
240 Riggs Ave.,
Plymouth,
Ohio

The J. D. Fate Co., 240 Riggs Ave. Plymouth, Ohio.

We are interested in the following machines or devices and ask that you send us special printed literature on the same, without obligation to us:
(List Items Here).........
....
(Firm Name)....................
(Your Name)....................
(City)............................
(Street)..........................
(State)...............................

draft kilns, which, together with the existing equipment, places this plant in good position to supply the demand for shale brick in its territory during the coming year.

TEXAS

The Brazos Brick and Tile Company has been incorporated at Rosenberg, Texas.

The Star Clay Products Company of San Antonio, Tex., has increased its capital stock from $100,000 to $150,000.

In the March 21 issue, it was reported that the Emmett Brick and Tile Company was installing new machinery at its plant at Gonzales, Tex. This evidently was an error as the Sunset Brick and Tile Company informs us that there is no such firm in that city.

An order for ten carloads of brick has been received by the Wichita Falls (Texas) Brick Company for use in rebuilding Paris, Texas, which was recently destroyed by fire. Considerable building has already taken place at this point in which a large amount of burned clay material is being used.

VIRGINIA

The plant of the Hopewell (Va.) Brick Company is now in course of construction, much of the machinery already having been installed. It is expected that operations will begin sometime during the present month. The company was recently organized with a capital stock of $25,000, much of which has been purchased by local business men.

WASHINGTON

The Denny-Renton Clay and Coal Company and the Unit Brick and Tile Company have erected striking exhibits at the Real Estate Show now being conducted at Seattle, Wash.

The Chehalis (Wash.) Brick and Tile Company just now is enjoying the largest business ever booked in the history of the plant. The company, which employs twenty men, has its kilns crowded to capacity trying to fill orders on hand.

"Our stock is entirely sold out and we are behind on our orders," writes C. B. Mayheigh, of the Star Brick and Tile Company, Bay View, Wash. Mr. Mayheigh goes on to say that the demand this year is greater than ever before. The company is installing a large quantity of new machinery, among which is an automatic cutting table. Plans are now being made for the enlargement of the drier by the addition of two more tunnels. Another kiln will also be built in the near future. This company's product is usually sold before being manufactured and, therefore, the sales force is a zero quantity. However, with the new equipment and an increased capacity of both brick and drain-tile, it is expected that a salesman will be put on the road to work up a larger demand for the increased output.

WISCONSIN

The Pennsylvania Coal and Supply Company of Milwaukee, Wis. has disposed of its fire-brick business to a newly organized company, which will be known as the Wisconsin Base and Fire Brick Company. The incorporators of the new company are: Ralph van Loo, Robert Steele and E. M. Kratz. The offices of the company will be located in the Caswell Block of that city.

The capital stock of the Oxford Pottery Company of Cambridge, Ohio, has been increased from $50,000 to $75,000.

POTTERY NOTES

A Resume of the Activities of the Potters and Some Mention of Their Plans for the Future

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Subjects pertaining to safety and sanitation have been considered by pottery manufacturers and Ohio state officials during the past two weeks. The committee representing the manufacturers was composed of W. Edward Wells of the Homer Laughlin China Company; Charles Sebring of the Sebring Pottery Company, and Charles F. Goodwin, secretary-treasurer of the United States Potters' Association. Edward Menge, president of the National Brotherhood of Operative Potters, and William Pittinger, Deputy Inspector of Workshops and Factories of Ohio, were appointed by the Ohio State Industrial Commission to act on this committee of the whole. Certain rules are now being drafted, and these will later be submitted to a committee composed of eight western pottery manufacturers. A like number of workers will also be named. This joint committee of sixteen will then unite in drafting a set of general rules to be posted in all potteries for the conservation of health and for the comfort of the workers.

It would be no surprise, according to a number of western general ware pottery manufacturers, to see another five per cent. added to the base of all invoices, making an advance of ten per cent. since the first of the year. In January, the manufacturers changed a number of items which had not been listed heretofore, giving each a definite size and price. This action placed all manufacturers of these items on a level. A few weeks ago the manufacturers of hotel china advanced their prices ten per cent. This was followed by the semi-porcelain ware manufacturers who announced an increase of five per cent. This advance, so it has been learned, has not been in proportion to the increased costs of raw materials and packages, and as a result, the second five per cent. is expected to be added before long.

As the annual convention of the National Brotherhood of Operative Potters is but a short time distant, sanitary pottery manufacturers are debating among themselves what demands will be made upon them for the next two years' wage scale. The various local unions affiliated with the parent organization have been formulating resolutions or demands for the past few weeks, but these will not be made known to the manufacturers until after the convention at Atlantic City in July. No wage demands will be made by the workers this year upon the general ware manufacturers. The scale for a two year term was signed last fall. It is reported that some branches of the sanitary trade desire an increase in wages, but how much will be sought, is not known at this time.

No intimation has been received from the offices of the Interstate Commerce Commission at Washington, D. C., concerning a decision in the rates on pottery clays from southern shipping points to northern Ohio Valley pottery and ceramic plants. Hearings, in which the proposed new rates were contested, were held recently before commission's examiners at Wheeling, W. Va. These new rates apply on clays from Florida, Tennessee and Kentucky. An increase of about twenty per cent has been proposed by the carriers in the face of the fact that the five per cent increase allowed them over

Burton & Townsend Haul Clay from Pit to Mill at a Cost of $4.15 Per Day

The Burton & Townsend Co., of Zanesville, Ohio, has a heavy haulage duty to perform over a short haul—the cars weighing gross 6½ tons each and the distance being at the longest point 1000 feet. Still, it only costs $4.15 per day for labor and fuel to operate the haulage system—which is far cheaper than horses or any other system.

They Do It With
The Plymouth
Gasoline Locomotive

The Burton & Townsend Co. has a horse-driven system at one of their plants and, therefore, can make an accurate comparison in cost.

Read What Burton & Townsend Co., Says

The Plymouth train delivering loaded cars at mill of Burton & Townsend Co.

"It costs us $3.75 for labor to operate the Plymouth—an operator costing $2 and a trainman $1.75. Gasoline and oil costs on an average of 40 cents per day," writes Mr. C. S. Shrum.

"Considering the capacity of our cars, the short time in which we complete the trip and the low cost of fuel and labor, we consider the Plymouth Locomotive much cheaper to operate than any other haulage system we have installed.

"The friction drive of the Plymouth is entirely satisfactory and certainly is more elastic than a gear-driven locomotive. There is one satisfaction, at least, with the Plymouth friction drive: If it does slip nothing breaks, as a gearing would.

"Our Plymouth Locomotive has not cost us a cent for repairs in the five or six months we have had it."

The Plymouth Can Do the Same For YOU

Doesn't it look reasonable to suppose that if the Plymouth can do this much for Burton & Townsend Company it can do the same for you? The Plymouth is worth investigating, at least, is it not?

Get Book of Facts

The Plymouth Book of Facts will tell you, not only of similar cases to Burton & Townsend Co., but give you some vital information on clay haulage. It is free for the asking—use the coupon at right.

The J. D. Fate Co.
240 Riggs Avenue
Plymouth, Ohio

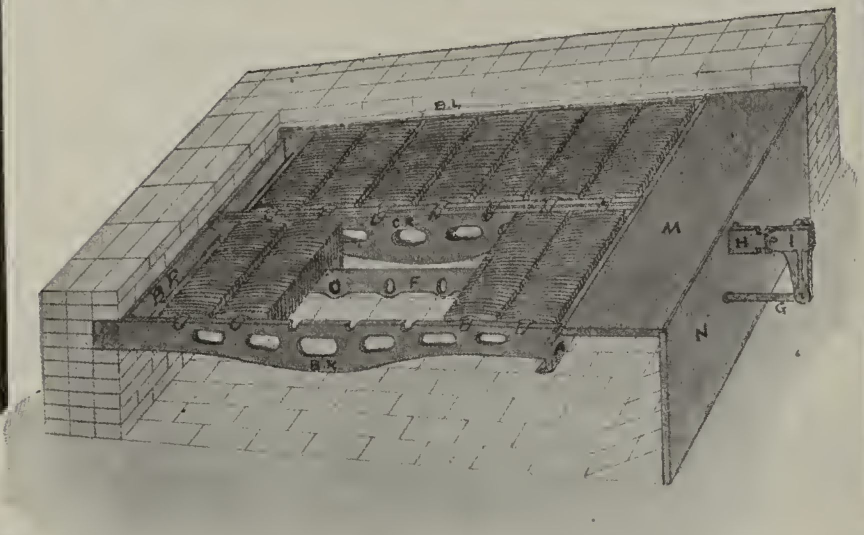
The J. D. Fate Co.
240 Riggs Ave., Plymouth, Ohio.

Send us The Plymouth Book of Facts, this request not to obligate us.

(Firm) ....
(Your Name) ....
(City) ....
(Street) ....
(State) ....

Don't Read This Ad.
if—
You Don't Use Boilers

otherwise—read it—there
is good news about
Cyclone Boiler Grates



Here are our claims—

Even distribution of draft.
No fuel gets into ash pit.
Locks level.
Burns cheap fuel.
No fingers to burn off.
Impossible to warp.

That's the kind of grate that you want

and we will sell it to you
on 90 days trial.

Write now for our Complete Catalog.

Cyclone Grate Bar Co.
BUFFALO, N. Y.

a year ago is now in effect. Should the carriers win their case, the manufacturers using these clays will have to pay twenty-five per cent more in transportation charges than they did two years ago.

The California China Products Company, National City, Cal., reports that business in its section has taken a turn for the better. Due to the discipline of hard times, which have gone before, this company has noticed a marked decrease in its cost of production. A new kiln for colored glazed ware has been built recently and the company has added a line of highly refractory fire-brick. An interesting feature in the sales department is that it is seeking export business for which it is prepared. However, progress along this line has been somewhat slow, owing to the impossibility of securing accurate credit ratings for foreign concerns.

Several questions, so it is understood, will be considered during the coming convention of the National Brotherhood of Operative Potters, which will relate to the internal affairs of the organization, but the manufacturers are not concerned in this phase of the meeting. In the western district, the kilnmen and the kiln drawers have not been working in exact harmony with the parent organization, so it is said, and an effort to form a new and independent kiln drawers' union was made at East Liverpool, Ohio, not so very long ago. The kilnmen at one time threatened to withdraw from the Brotherhood, but cooler heads prevailed.

M. L. Wolff and Newton W. Stern, owners of the Pacific Porcelain Ware Company and the Pacific Sanitary Manufacturing Company of Richmond, and San Francisco, Cal., have completed negotiations with Herbert F. Brown and his associates, owners of the Western States Porcelain Ware Company, for transfer of the control of the latter company and the consolidation of the three companies. Matthew Platts, formerly manager of the Western States Porcelain Ware Company, has resigned and has been succeeded by W. A. Potter, who has been chief potter for the company. Mr. Platts will organize a new company.

Girl strikers in the five Sebring (Ohio) pottery plants, in the ware-dressing departments, went back to work on April 5, following an amicable adjustment of their demands upon the manufacturers. An increase of five per cent. in wages is understood to have been made, while the brushers and dippers were also granted concessions. The latter with their helpers struck following the announcement of an increase granted to the dressers, and at first demanded a fifteen per cent. raise, but an arbitration board settled the matter without any prolonged idleness on the part of the dissatisfied workers.

The selling prices of domestic pottery have been advanced during the past few weeks from five to ten per cent, with all cash discounts withdrawn. Manufacturers were forced to take this step on account of the constantly increasing costs of raw materials, and the end is not yet in sight. Almost daily, potters are receiving notices from manufacturers of raw material and selling agencies, of additional advances, so that they do not know from one day to another what clays and other supplies will cost them.

The McGuire Electric Porcelain Company, which is controlled by George E. McGuire, recently purchased the plant of the New Brunswick (N. J.) Tile Works and has moved its plant from Trenton, N. J. to that point. The old machinery that was in the New Brunswick plant has been rearranged and new machinery installed which will put the plant on a higher plane of efficiency.

MACHINERY *and* EQUIPMENT

Descriptions of Machinery and Accessories and Detailed Announcements that Our Advertisers Believe will Interest Our Readers

Crushing Clay Previous to Feeding to Dry Pan

The dry pan, as used in a large majority of our plants, is undoubtedly the most abused piece of equipment in the factory. It is a very common feeling among the men of the pan crew, and even the owner, that the dry pan was built to stand hard usage—so "let her rip."

Consequently it is not at all an uncommon sight to see the pan loaded to the brim suddenly, or see it choked full of great hunks of shale or clay, causing a battering of every single part of the machine.

The grinding and screening capacity of the pan is practically at a standstill during that portion of the time in which it is forced to reduce the pieces to grinding, screening size.

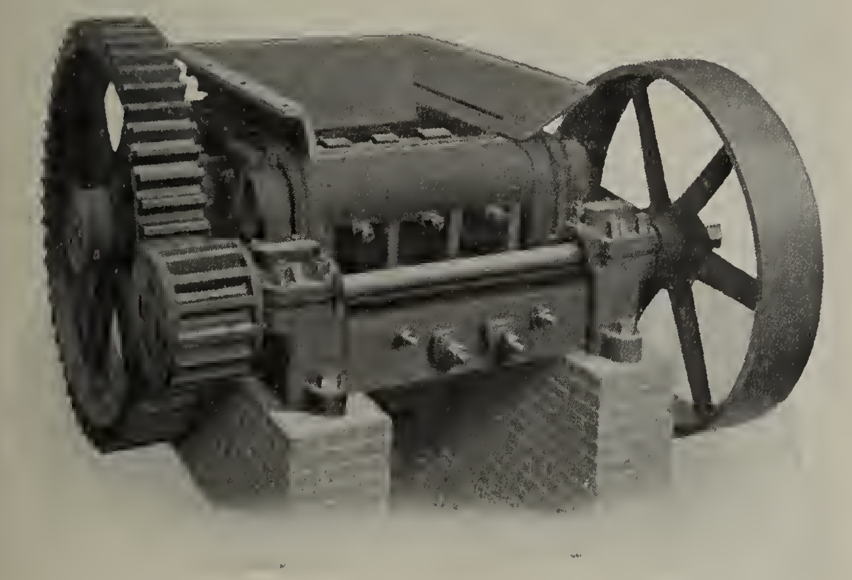
Just a little thought and study should convince that the pan is not doing its maximum economic best if it is forced to periodically suspend grinding operations and become a crusher.

The conviction comes that if the maximum capacity, full quantity of ground material is to be obtained at a minimum expenditure for power, repairs and machinery, then it is absolutely necessary to feed the pan digestible material, small enough to be pulverized with a minimum effort. Here's why:

Go to your dry pan and watch it, see it wade thru each different phase, compare the screened output of the different phases and note the labor expended by the pan to produce the results that you have seen.

For example—note when the crew man raises the trap door and "loads her up" with great large chunks. Of course the mullers plow into it, crawl over it, bounce and bang around like something alive, and in time the whole machine settles down to a purr and "eats it up."

In this instance the pan was non-productive during all the time that it was crushing instead of grinding, and in



"Meco" Single Roll Crusher

COAL SERVICE

With three of the largest and best equipped mines in the U. S. A., producing 12,000 tons per day, we can furnish long flame, quick ignition, low ash coal ON TIME.

No better coal is mined—no better service is possible.

OUR NOKOMIS or LIVINGSTON COALS

come to you clean—sized, and run over modern picking tables.

No expense is spared in making these good coals **better.** That is why it is profitable for you to use them.

Shipped everywhere west of Indiana on the Big 4, C. & E. I., and I. C.

Rutledge & Taylor Coal Co.
St. Louis Chicago

With the coming of the time to make a new coal contract

and the uncertainty of the outcome of the Miner's Wage Controversy now on

it behooves the manufacturer of brick and clay products to have a complete and accurate knowledge of conditions in the coal trade from week to week. Not that he merely knows of those things having a direct bearing upon his business, but that he may prepare himself against any shortage of coal by placing his contract and orders in accordance with conditions.

THE BLACK DIAMOND

for over 30 years the coal trade's leading journal, publishes the greatest amount of news and information pertaining to the situation.

The Annual Steam Coal Contract Number, the March 18th issue contains much in its editorial and advertorial pages that will help you to more economical use and buying of coal for your particular purposes.

May we help you to a more accurate knowledge of conditions in the coal trade, by beginning your subscription with that Number? Costs but $3.00 the year. Issued weekly.

THE BLACK DIAMOND

Manhattan Bldg., Chicago

New York Cincinnati Pittsburgh

addition there was every probability that a muller in dropping over a large chunk of material would break the supporting rods or chains, and subsequently break out a piece of the muller or screen plates. The same result is accomplished by the muller falling off a large piece and landing on a boulder, the force transmitted to the plates is often sufficient to break out a hole.

The net result of this is of course problematical, but the chances favor a clogging of the under panwork, the chutes, the elevator and tailing chute—and the broken piece returning to the pan via elevator and tailing chute and sticking under plows or running under mullers is perfectly capable of destroying screen and muller plates as often as replaced.

It seems perfectly evident then that under the above circumstances the pan can not produce to capacity, and there is the added disadvantage of risk of breakage, wear and tear and excess power expenditure applied intermittently.

If, on the other hand, the clay material is crushed to approximately double fist size before being fed into the pan a great increase in capacity is insured, a great decrease in repairs and depreciation is a positive fact. A specific instance is noted where three pans were required, the addition of a preliminary crusher made it possible for two pans to do the work on about 70 per cent of former running time.

In most cases—a pre-crushing machine is a real necessity. Figure it out to apply to your conditions and then send to The Manufacturers Equipment Company of Dayton, Ohio, for information relative to the "Meco," a single-roll rock and shale crusher.

Foundry Specialists

The firm that specializes is the firm that concentrates every strong arm punch on the making and marketing of one single type of product.

By this concentration, the type of product selected (whatever it may be) is produced in a superior manner, at a lower cost.

The above is taken from the first page of the new catalog just issued by the Pettigrew Foundry Company, Harvey, Ill., and they continue, calling attention to the fact that they are "foundry specialists" and in connection with their foundry have a complete pattern shop, a modern machine shop, and a steam-hammer blacksmith shop—all necessary parts of an efficient foundry.

The Pettigrew Company has a line of high-grade cars, turntables, and all cast equipment, only a small portion of which they have been able to illustrate.

Prompt and courteous treatment is assured all inquiries, and a copy of the booklet is yours on request.

Digging Clay

How best to dig the different types of clay is a constant study for the workers. Economy of digging and loading is always to be desired, but must not be given preference to the condition in which the material is gotten out. In some cases it is essential that the different layers or strata of clay be kept separate; in others the desire is to thoroly mix the entire bench. In all cases it is best to have the material leave the pit in the best possible shape for the pugmill, pan or grinder. The cost of many of the operations about a clay pit can be materially reduced, and the excavated clays put in better shape by rational use of explosives.

Stripping and draining clay pits is also a matter of importance that should not be overlooked when planning the work.

The E. I. duPont de Nemours & Company, Wilmington, Del., has just had printed a Clay Blasting Booklet, the opening paragraphs of which we have given above. As it is the first booklet ever issued on this subject it contains valuable and interesting information. Some of the phases covered are "Digging Clay," "Stripping," "Blasting Down Shale," "Digging Plastic Clays," "Mining Flint Clays," "Draining Clay Pits," as well as full information on the use of explosives.

The booklet will be sent to any address upon request.

New Connection for H. L. Longnecker

The Hook Patent Kiln Company, Vigo, Ohio, H. P. Jenks, manager, has been particularly fortunate in securing the services of H. L. Longnecker, who is well known in the clay-products industry.

Mr. Longnecker is a full-fledged ceramic engineer, having graduated from the Ohio State University in 1911. He was with the Southern Clay Manufacturing Company at their Robbins, Tenn., plant and also at their Coaldale, Ala., plant, rising thru two foremanships to the supreme honor of being assistant superintendent under A. F. Greaves-Walker at the time he was superintendent at the Coaldale plant.

In August, 1912, Mr. Longnecker became associated with the Green Engineering Company, Chicago, remaining with them about three years in charge of their fire-brick department. While in this position he contrived to pick up a knowledge of combustion engineering during odd moments; and it was also at this time that he invented their famous spall test, which has made their Suspended Flat Ignition Arches so well known for their enduring qualities.

After leaving the Green Engineering Company he held the superintendency of the A. N. Green plant at Mexico, Mo., only to return shortly to the engineering field and is now affiliated with the Hook Patent Kiln Company. In this present capacity it will be Mr. Longnecker's endeavor to work for the betterment of the kilns and burning methods now used by clay-products manufacturers.

The Murray "Duplex" Boiler

Good, economical engines and boilers play a very important part in keeping down the rising figures on the monthly and yearly cost sheets. In fact, a big portion of the plant expense must be charged to the boiler and engine room.

It is a mistaken idea to try and do with old, worn-out, wheezy and under-powered machines, for it is really marvelous to see the extra sustained steam pressure that can be maintained at a lower cost if the modern boiler is used.

Facsimile of the New Murray Catalog

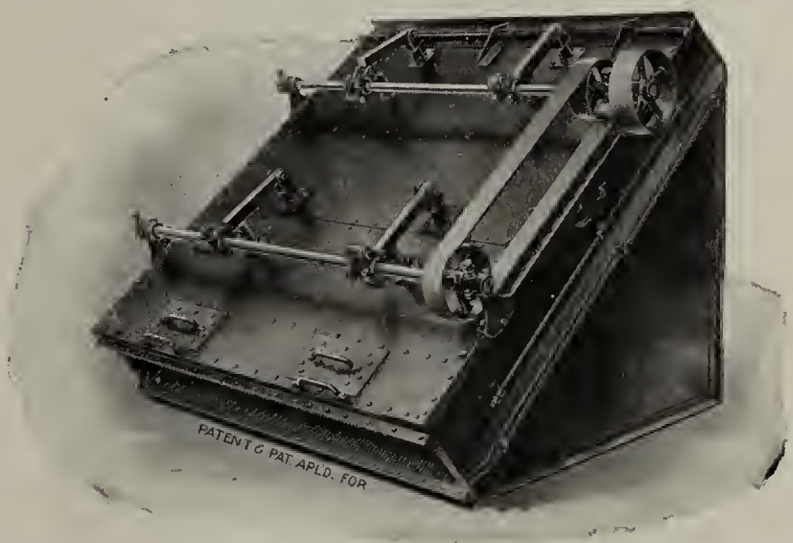
STURTEVANT - NEWAYGO
CLAY SCREEN

A Cause—

No piano wire or perforated metal screen can compete, either for Capacity, Accuracy, Small Power of Upkeep with the Newaygo.

The Newaygo is equipped with a wire cloth screen at a 45° angle. This screen is rapidly, yet not destructively vibrated, preventing a clogged screen. This ensures open meshes which means large output.

A steel case encloses screen, making it practically dust-proof.



A Result—

Dozens of very high class clay plants are using the Newaygo. Read this letter from one of them:

DIDIER-MARCH COMPANY.
Perth Amboy, N. J., March 25, 1913.

Sturtevant Mill Company,
Harrison Square,
Boston, Mass.

Gentlemen: We beg to acknowledge receipt of your favor of the 21st inst., and in reply, beg to advise you that we have found the Newaygo Screen, which we recently purchased from you, a very efficient and economical Screen and one far superior to the general type or revolving screen. We therefore do not hesitate to recommend same for economically screening crushed brick and clays.

Very truly yours,
Didier-March Company,
(SGD) Louis A. Witte, Const. Engr.

Send for Catalog—today

STURTEVANT MILL CO.
BOSTON, MASS.

This "QUAKER CITY" Belt has been in constant use for 11 years

You who are used to belting going bad in one to three years, think of the record of this belt on a mule drive.

Service and economy are the natural results of uniformly high quality.

Everywhere, engineers recognize these goods as standard—

P. P. P. ROD PACKING
Reg. U. S. Pat. Off.
EBONITE SHEET PACKING
EBONITE PUMP VALVES

We have a mighty interesting proposition for plant owners and superintendents who desire to increase efficiency and reduce costs by **standardizing** the Mechanical Rubber Goods used.

FREE Write for a copy of our Pocket Catalog, 62 pages—6x3¾-in.—illustrated in colors. There's a lot of mighty valuable information in this handy little book. Ask for Catalog 4-D.

Quaker City Rubber Co.

PHILADELPHIA 629 Market St.
CHICAGO 182 W. Lake St.
PITTSBURGH 211 Wood St.
NEW YORK 207 Fulton St.

Our ideal of the modern design in boilers is contained in the following:

1. It must be self-contained, with the furnace inside.
2. Must be cylindrical in form without flat surfaces requiring unusual bracing or staybolting.
3. Must have no external brick work.
4. Must have no flat interior heating surface to collect oil, scale and mud, causing burnt sheets and liability to rupture.
5. The circulation of water must be rapid with no cold or dead spots causing unequal expansion, strains and leaky seams or rivets.
6. The gases must travel so that the maximum number of heat units are utilized in the production of steam.
7. All parts must be readily accessible so as to facilitate cleaning and overhauling.
8. The design must be simple, making the first cost reasonable and reducing the operating engineer's boiler troubles.

This in brief is an outline of the essential theories forming the basis on which the new Murray "Duplex" boiler is built. The design is common sense, yet a radical departure from old time ideals.

A handsome catalog containing description, outline drawings and photographs may be had by application to the Murray Iron Works Company, Burlington, Iowa.

The Walter A. Zelnicker Supply Company, St. Louis, Mo., has recently opened a Chicago office, located at 423 First National Bank Building, where inquiries will be given the same prompt and courteous attention as at the main office.

This company deals in new and second-hand machinery, rails and various kinds of equipment, fully listed in their regular bulletin—copy of which is yours for the asking.

Regarding the Uses of Wire Rope

A statement frequently made by us is, "Tell us what you want to use the rope for, and we will suggest the proper rope for the purpose."

The invitation brings requests for rope to be used in ways varying from lifting large locomotives to operating miniature shovels.

While most of our illustrations show only equipment, we take pleasure in making an exception by showing one of our many satisfied customers together with his equipment.

In appreciation of the Leschen service this "customer" wrote to our representative who booked his order, as follows:

The Engineer and Equipment

Dear Friend:—I got your rope today. It is dandy and I thank you very much. It works fine on my steam shovel. I will tell every one about your good rope.

I hope you will have a nice Christmas and sell lots of rope next year. Good-bye. (Signed) George Beckwith.

If you are interested in good wire rope service—it matters not for what purpose used—write us for our recommendation.—"Leschen's Hercules."

World's Largest and Best Line of Clay Working Machinery

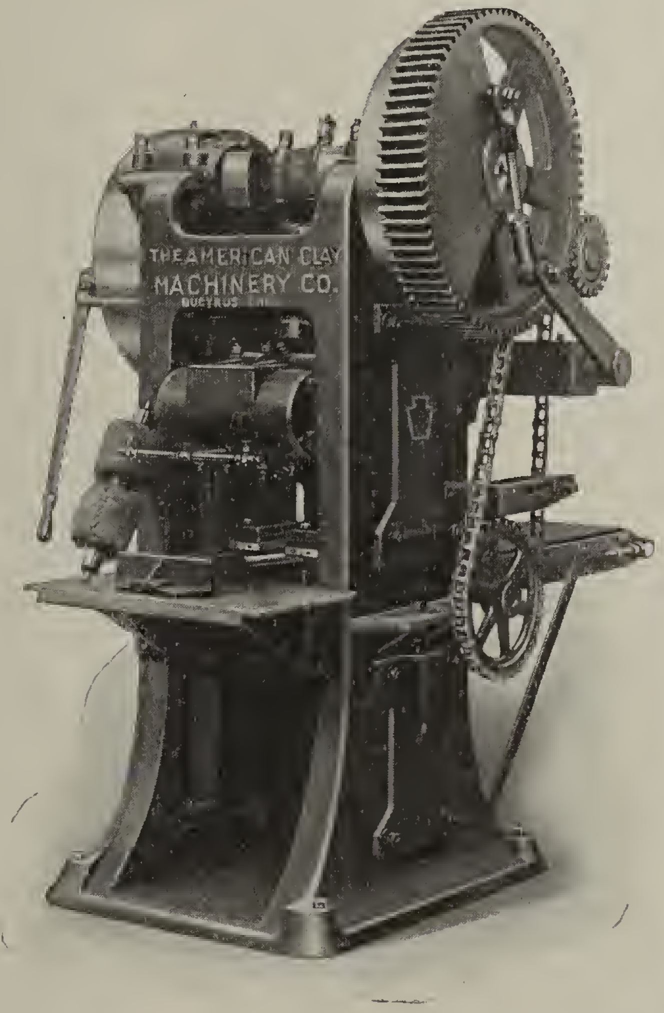
Selected As the Best
Selected By the Best

There isn't a repress built that will compare—point by point—with the American No. 292. It has more superior features than any other, and these advantages—with the quality to back them up, will make the No. 292 a day to day success in your plant and will keep it a success for more working days than any other machine of its kind.

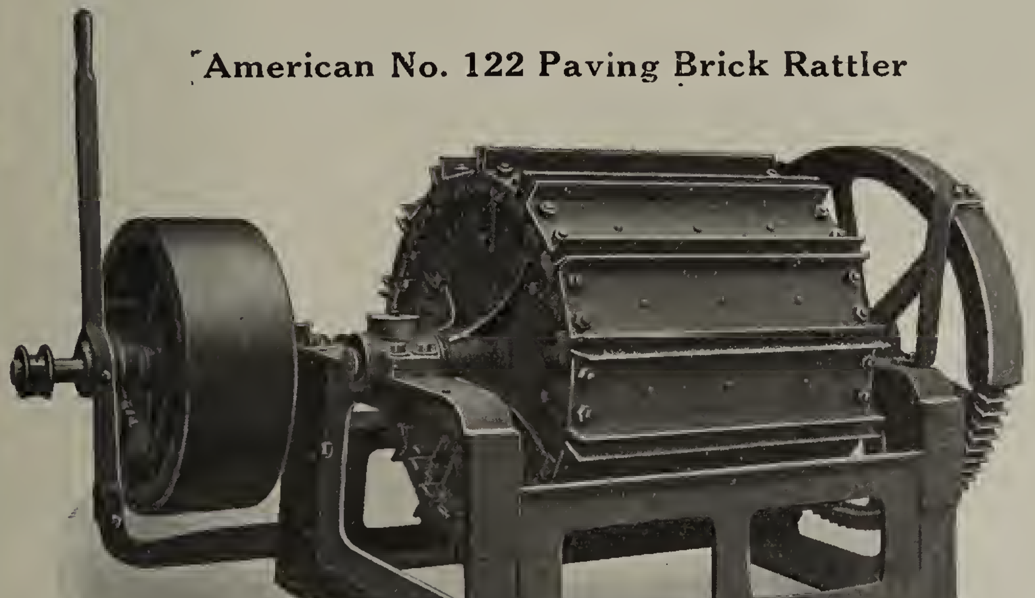
In your own interest we ask you to investigate the No. 292. It has been selected as the best repress by some of the best Clay Workers in the country. The men who know quality and who produce quality are using it. Here are a few of the buyers who are using the No. 292:

The C. P. Mayer Brick Co., Bridgeville, Pa.; Brick, Tile and Terra Cotta Works, M. E. Gregory, Proprietor, Corning, N. Y.; Lincoln Paving Block Co., Corning, O.; Harbison Walker Refractories Co., Pittsburgh, Pa.; Thornton Fire Birck Co., Thornton, West Va.; Alliance Clay Products Co., Alliance, O.; Burton, Townsend Brick Co., Zanesville, O.; Streator Clay Mfg. Co., Streator, Ill.

Let us send you our new bulletin giving the complete detail of the No. 292 Repress. It's "the press you ought to buy at the price you ought to pay."



American No. 122 Paving Brick Rattler



American Brick Rattler

Here is a machine you need not fear if your clay is right and your equipment is the "Built Right, Run Right" kind.

This rattler is built on approved specifications of the Bureau of Standards and will operate for years without repairs. Send for bulletin giving complete description.

**The American Clay
Machinery Co.**
Bucyrus, Ohio
On the Lincoln Highway

No Want Too Small or Too Great

SAY "I SAW IT IN"
BRICK AND CLAY RECORD

Brick and Clay Record Buyers' Directory of Manufacturers of Machinery, Equipment and Supplies

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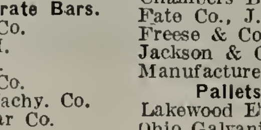

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No. 32 High Temperature Cement

is mixed with water and painted at the time of setting over the entire masonry surface that comes in contact with flames or hot gases. It vitrifies at a low temperature, producing a granular surface of uniform structure that will not chip, crack or spawl, despite the severity of the temperature or its variation. Write for complete data on this treatment. Any branch will quickly forward it.

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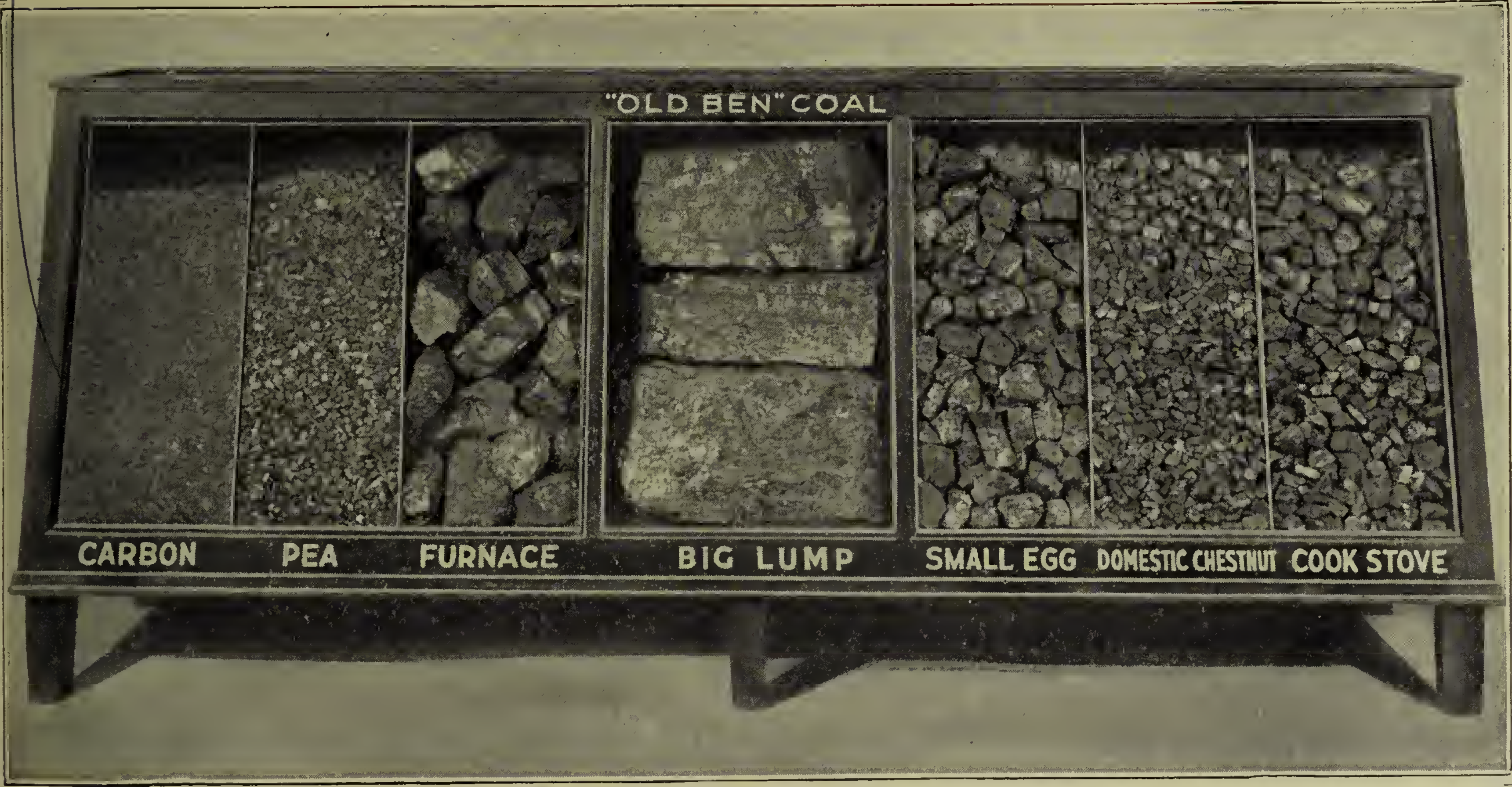

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Vol. XLVIII, No. 9 Chicago May 2, 1916

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SAY I SAW IT IN BRICK AND CLAY RECORD

BRICK and CLAY RECORD

Entered as Second Class Matter January 2, 1911, at the Post Office, at Chicago, Ill., Under the Act of March 3, 1879.

Terms of Subscription
One Year—(24 Numbers)
United States......$2.00 Foreign $3.00
Single Copies.......25c

Published the first and third Tuesdays of each month by

Kenfield-Leach Company
445 Plymouth Court Chicago

Chicago, May 2, 1916
Vol. XLVIII No. 9

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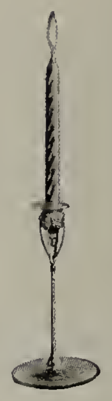
The EDITOR'S CORNER

Comment, Criticism and Advice on Live Issues Affecting the Manufacture, Marketing and Manifold Uses of Burned Clay Products



THERE is one question that is heard a great deal in clayworking circles, sometimes in confidential chats between members of the various branches of the industry, and at other times in whispered conferences that have been called to consider some serious problem of manufacturing or selling. At its very statement there are some who will leave the room or flee from its sound, fearing to be anywhere near the gathering or group where this question is being discussed. On the other hand, there is a growing tendency on the part of some manufacturers to come out in the open as regards this query and to run it down, hoping in this way to clarify the befogged atmosphere that surrounds its legality. It is:

"How are we going to fix prices?"

For a long time business men, which includes those engaged in the manufacture of clay products, have believed that the answer to this question would contain the solution to all of their problems. Whenever markets have tightened and profits are slowly, but surely, being wiped out, the answer to this question has been regarded as sort of a haven, the realization of which would insure safety from the tempestuous seas of sharp competition, but—

And here they have stopped, unable to proceed any farther, bound hand and foot by governmental legislation, the application of which has been hard to understand and whose scope has never been clearly defined.

And even then, when conscientious, law-abiding manufacturers have gone to Washington to obtain some interpretation of existing laws covering the carrying on of interstate commerce, they have obtained little satisfaction, owing to antiquated governmental policies. No one there seemed willing to advise and help these manufacturers. Farmers have been encouraged by the federal government to stand together for profitable prices for their products and, under the guidance of the government and fostered by favorable national legislation, have been successful in obtaining what they have deemed a fair return for their labor.

Not so the manufacturer. Any effort which he has made toward price maintenance has been looked upon with righteous indignation and consequently his reception at the national capital has been somewhat chilly and ofttimes unkind.

A Champion of Business

HOWEVER, there has risen from the ranks of those who have made their life work the turning of raw materials into finished products, one who fully understands the problems of the manufacturer and who is in position to help him with his difficulties. This man is Edward N. Hurley, vice-chairman of the new Federal Trade Commission, a business man from Chicago.

A sketch of the life of this new factor in the relation of the manufacturer to the government is given in tabloid form in a recent issue of the "Saturday Evening Post" in an article by James H. Collins, who strikes the keynote of success in the solution and adjustment of the problems of the American manufacturer as regards the maintaining of prices. Mr. Collins says:

"Mr. Hurley is a manufacturer who has come up in a way typical of many American business men. Starting out with a common-school education and a machine-shop training, he became a locomotive fireman, then an engineer, then a salesman of railroad supplies, and then salesmanager. He was an inventor also, and eventually took a partner, put a few thousand dollars of his savings into a small factory and started making pneumatic tools. He got in on the ground floor of a big industry when profits were ample and made a fortune; but in building his business, he met with all the handicaps. He knows what it is to hustle money for the payroll, and says that meeting the payroll is a sort of initiation for a business man that brings him into the real fraternity, with the grip and password. He knows what it is to go to the bank and dig up information upon which to borrow money.

"In addition to an all-around business experience in this country, he has financed and operated a factory in England, studied the methods of the Germans, and investigated export trade in South America. His special report on the way they handle banking and credit in Argentina, Brazil, Chile and Peru, published by the Department of Commerce, is decidedly an eye-opener. He has been president of the Illinois Manufacturers' Association, and connected with railroad and financial matters in various capacities, and is a real, all-around business man."

Mr. Hurley was one of the five men who were appointed by President Wilson to constitute the Federal Trade Commission, there being two lawyers and three business men. This body, it will be remembered, was created to take over the work of the old Bureau of Corporations, and has power to investigate and prevent unfair competition.

Mr. Hurley had hardly got settled in Washington, after his appointment, when he had an opportunity to investigate and study the price maintenance question, which it seems is the prevailing thought in the minds of many business men. He set about to find an answer to it and, in so doing, dug down into the files and statements made by American corporations to the United States government under the corporation tax law, to learn what he could about profits.

He found that there are two hundred and fifty thousand manufacturing and trading corporations in the United States, more than one hundred thousand of which report no net income whatever. Ninety thousand other corporations report a net income of less than five thousand dollars a year, while only sixty thousand in the country make five hundred dollars a year or more.

Corroborating this information was Mr. Hurley's own personal experience which had taught him that for a long time profits in manufacturing had been steadily shrinking. With this data in hand and with a knowledge of the personal makeup of many large manufacturers, he dug deeper into the problem and has found what he believes is the reason for the small bank balance of so many concerns.

It is true that the heads of many large manufacturing establishments have risen from the ranks. The skilled mechanic of yesterday is the foreman and manager of today, and the manufacturer of tomorrow. The same is often true of salesmen. Neither of these two types of men have ever had much experience in the accounting departments of the business and, consequently, this branch of the organization is not held in very high esteem by either the producing or selling end of the business. When men from these departments become manufacturers, this disadvantage goes with them, with the result that many business enterprises are conducted with a very loose accounting system.

A False Impression

THE CURE for the ills of American industry, Mr. Hurley contends, and we contend too, is not to be found in the control of prices, but in uniform systems of bookkeeping and cost accounting for every branch of manufacture. Price cutting is nearly always the result of a lack of cost knowledge, while this in turn is based on a lack of good accounting methods.

The trade association is the logical instrument with which to correct these evils and offers an excellent channel thru which a uniform system of cost accounting may be formulated and adopted. This is the only way to regulate prices. It is absolute folly to fix prices, without a knowledge of costs, and whether it be legal or illegal, it is not the panacea for business ills that many would have it believed.

There is another advantage of a standard system of keeping costs, concerning which little has been said, but which is far too important to be overlooked. It is, that with a trustworthy balance sheet, showing the state of your business in terms that your banker can understand, you can go to him and probably borrow thousands of dollars where now you get only hundreds. This would give you a larger capital with which to expand your business. More than that, when people who sell you goods, write to your bank for a rating, the bank can definitely tell how much credit you are entitled to, and would, as a consequence, be more liberal.

Edward N. Hurley deserves much credit for what he has done for American business men; more strength to his arm, conviction to his tongue and power to his pen. While the Federal Trade Commission does not plan to use any compulsion in introducing standard cost systems—in fact, it has no direct power—it has organized a force of cost experts and accountants, and is ready to advise the individual business man or business associations, helping them work out a standard cost system.

Why Shut Out Brick

A BILL of considerable importance to paving-brick manufacturers was recently reported out of the Committee on Post Offices and Post Roads by United States Senator Bankhead, chairman. It is known as the Good Roads Bill, having recently passed the house and sent to the senate, where the above-mentioned committee made some slight changes in it. This bill, instead of providing the twenty-five million dollars annually which has been the custom in years past, appropriates only the sum of five million dollars as the government's share in road improvements for the fiscal year ending June 30, 1917; ten million for 1918; fifteen million for 1919; twenty million for 1920 and twenty-five million dollars for 1921.

However, this reduction in the appropriation, while regrettable, is not nearly so important an objection as the wording of certain clauses in the bill, which may be interpreted as placing a limitation on the total cost of any road in which the government bears a part of the expense.

The clauses in this Good Roads Bill which demand the utmost attention on the part of paving-brick manufacturers are contained in section six, the first of which appears on page eleven, commencing at line nineteen, and states:

"The Secretary of the Treasury shall thereupon set aside the share of the United States payable under this act on account of such project which shall not exceed fifty per centum of the total estimated cost thereof."

In the same section, on page twelve, commencing at line thirteen, it reads:

"Nor shall any such pavement be in excess of $10,000 per mile, exclusive of the cost of bridges of more than twenty feet clear span."

The National Paving Brick Manufacturers' Association states that it has information to the effect that some members of the United States Senate are inclined to the opinion that the government ought not to furnish a contributive share for the construction of roads where the cost thereof exceeds $10,000 per mile. It is not known to what extent this opinion prevails, but if the good roads bill should pass, containing such provision of limitation, then, so far as the brick industry is concerned, the government had just as well withhold appropriations.

In order to correct, so far as possible, this attitude and to endeavor to have the objectionable wording in the above mentioned bill changed so that it will not discriminate against the brick road, every paving-brick manufacturer is urged to write his congressmen, asking that the lines above quoted be eliminated and in their place, commencing at line nineteen, page eleven, section six of the bill, the following be inserted:

"The Secretary of the Treasury shall thereupon set aside the share of the United States payable under this act on account of such project, a sum not exceeding $10,000 per mile and which shall not exceed fifty per centum of the total estimated cost thereof, exclusive of the cost of bridges more than twenty feet clear span."

It would seem that the use of this language is certainly sufficient to limit the government's share to not exceeding $10,000 per mile, regardless of what the whole cost per mile of the road may be.

In view of the fact that this bill seems to discriminate against the better and best types of road, it would seem that sufficient opposition should be developed to make the change in the bill as above outlined. Paving-brick manufacturers can do their share by making their congressmen feel that the action contemplated is entirely unwarranted, unjust and without due consideration for true economy in road construction.

A TRIO *of* MONU-

The True Story of the East Nashville, Augusta and Which the Claims of Wood to Fire Resistance Have

NOW that all of the judges have passed their decision on the phenomena of three large conflagrations in southern cities on March 22, involving a loss estimated at from eighteen to twenty million dollars, "Brick and Clay Record"—with its established policy of making a careful investigation of facts in cases of this kind—desires to present the story from the clay products manufacturers' standpoint and to "nail" some false statements that have been made regarding the fire resistant qualities of brick.

Within twenty-four hours from five o'clock on the morning of March 22 until the same hour the following day, large sections of the thriving southern cities of Nashville, Tenn., Augusta, Ga., and Paris, Tex., had been swept by fire which left in its wake blackened ruins and broken homes.

NASHVILLE FIRE INTERESTING TO BRICKMAKERS

The Nashville (or more properly, East Nashville) fire is, perhaps, the most interesting from the brickmakers' standpoint, because of the activities of certain lumbermen in defense of their material and in endeavoring to prove that the conflagration showed the resistance of wood to the spread of fire.

Nearly seven hundred buildings in the residential district of East Nashville were destroyed by the fire, representing a loss of approximately one-and-a-half millions of dollars and three thousand homeless people. Many of the city's most magnificent public and private institutions, churches and schools were burned to the ground. One person was killed, while several are said to have been fatally injured and many were more or less seriously hurt in the disaster.

The flames, which were carried onward before a gale that blew at from forty to fifty miles an hour, swept everything before it for a width of two blocks.

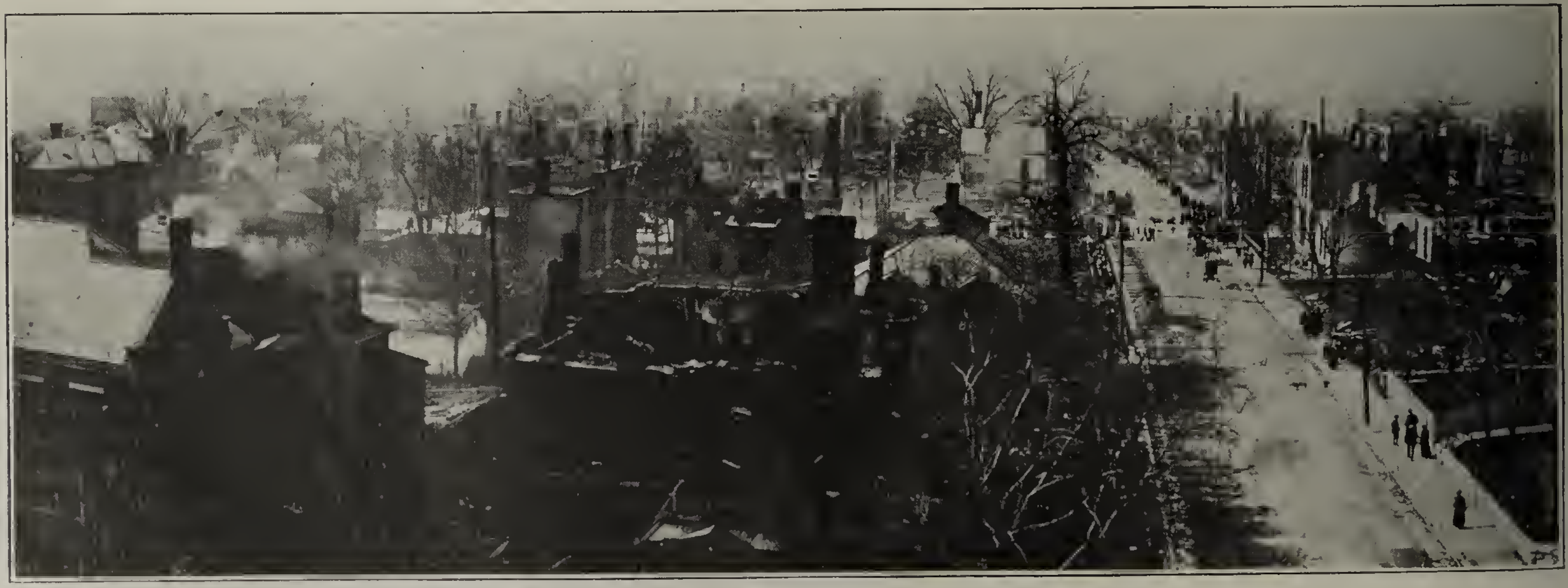
The fire was started, according to reports, by a lighted ball of yarn thrown into a vacant lot filled with dried grass, by a colored boy early in the afternoon of the twenty-second. The flames spread rapidly to the rear of a planing mill, which was an old frame structure, covered with sheet metal and in a dilapidated condition. This building was quickly consumed, the sparks and embers from the mill being carried for blocks by the high wind, causing the flames to break out several blocks away. Beginning at the planing mill the flames spread rapidly up Oldham to Putnam street, which brought them to the tracks of the Louisville and Nashville Railroad, which passes thru the town in sort of a valley with a hill just beyond. The fire, upon reaching this valley, jumped across it and struck the hillside at about the same level, spreading over the hill and burning itself out when it came to the edge of the town.

This, in brief, is the way in which the fire started, continued its work of destruction and finally ended. The details, which are numerous, are eliminated for the most part. Some of these, however, will be taken up in particular later in the story.

Regarding this fire, the "American Lumberman" published in its issue of April 1, on page 29, an article under the heading: "Big Fire Shows Wood's Power of Resistance," which reads as follows:

WOOD CLAIMS FAVORABLE SHOWING IN FIRE

> Nashville, Tenn., March 27.—Considerable indignation has been aroused among Nashville lumbermen through the raising of the old hue and cry against the shingle roof, which has been offered as an explanation of the East Nashville fire, last week, which practically wiped out thirty-five residential blocks. Although since the great Salem (Mass.) fire certain interested parties have held up the shingle roof and wooden dwelling bugaboo, it is significant that the Nashville public is freely commenting upon the fact that everywhere the conflagration was stopped in the fire district at a wooden house.
>
> Not only that fact strongly recommends the wooden dwelling but thruout the fire district there are still standing shingle-roofed houses slightly damaged from the fire, while only a single brick residence which was in the path of the flames is left standing. In every instance, save this referred to, which was saved by reason of the fact that more than twenty volunteer fire fighters were constantly stationed on the roof, all brick houses in the fire zone have left only crumbling walls to mark their former place.



A Panoramic View of the Burned Section at East Nashville, Tenn., Showing That Brick Constitutes All of the Visible Remains

MENTS *to* FRAME

Paris Conflagrations on March Twenty-Second in
Been Weighed in the Balance and Found Wanting

Thruout the fire zone are to be found frequent instances of wooden dwellings untouched by the flames while brick buildings alongside are in ruins. A notable instance of the non-resisting qualities of other than shingle roofs is to be found in the Cumberland Presbyterian Church which was directly in the path of the flames. The magnificent structure, valued at $40,000, was covered with a slate roof and burst into flames from the interior like a volcano, altho there was no fire in the interior to ignite the inflammable furnishings.

The three-story Warner School Building, valued at $74,000, was totally destroyed while a wooden residence on the opposite corner of Seventh and Russell streets was untouched by the flames. Along Main street a number of wooden dwellings remain standing alongside of where handsome brick residences are now in ruins. No more remarkable instance of the failure of metal and composition roofs to resist the flames, which were fanned by a forty-mile-an-hour gale, could be found than on Shelby avenue and Sylvan street, between Sixth and Eighth streets, directly in the pathway of the conflagration. Spectators stood astonished as the flames wrapped around a small wooden cottage directly opposite a two-story brick residence burning fiercely but the wooden house, which had been sprinkled freely with a small garden hose, escaped ignition.

Not a brick dwelling in this particular area of the fire zone escaped the flames while many wooden cottages remain standing.

A number of prominent Nashville lumbermen lost their homes during the fire, which raged from 11 o'clock Wednesday morning until shortly after 6 o'clock in the afternoon, when the wind subsided and the firemen were able to check the flames. Among those who were burned out were F. M. Hamilton, president of the Hamilton Lumber Company; Joe Wallace, of Norvell and Wallace; Wendell McFadden, bookkeeper for Love, Boyd and Company, and C. O. Summitt.

LUMBERMEN'S CLUB CHAMPION HUMORISTS

Altho President Willis Farris, of the Nashville Lumbermen's Club, will not appoint the standing committees until the next meeting, instructions were issued Secretary Ewing at the last meeting to draft resolutions concerning the resisting qualities of wood in the East Nashville conflagration last week. The resolutions are as follows:

"Whereas, Nashville was visited by a disastrous fire on Wednesday, March 22, by which a loss of some $2,000,000 was caused, and a large portion of the residential district of East Nashville was destroyed; and

Whereas, It is a matter of common observation and much comment that many frame buildings, particularly dwellings, were saved or escaped the full fury of the flames, while brick buildings only a few feet removed from them were totally destroyed; and

Whereas, Many small frames residences were saved even in the path of the fire, where the residents were able to keep them wet by the use of buckets or garden hose; and

Whereas, The edges of the fire zone show that the fire was stopped in almost every instance by or close to frame structures; and

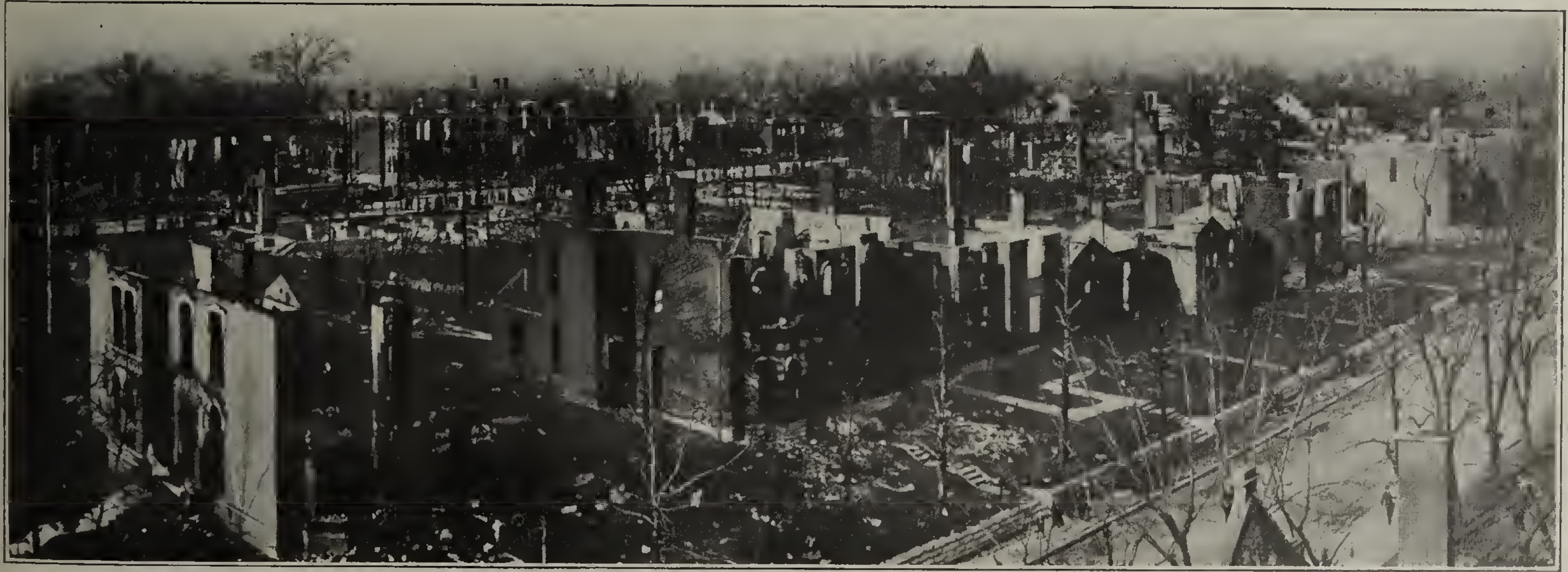
Whereas, Many partially-burned frame structures are now standing, while brick buildings in which the fire found lodgment were in almost every instance totally destroyed; and

Whereas, Many partially burned frame residences offered friendly shelter to their former occupants who would otherwise have been rendered homeless, while the walls of burned brick buildings were an added menace to life and limb; therefore be it

Resolved, That our observation is that buildings of frame construction offered better resistance to this fire than did those of brick construction, and that these resolutions be spread upon the minutes of the club in testimony of this fact.

It is with great hesitancy, and only after a most careful investigation at the scene of the disaster, that we brand this story as being very misleading and in most of its statements, untrue. It is more than possible that the "American Lumberman," relying upon a local correspondent, has been furnished unreliable information, and with this thought in mind, we venture to correct these statements and to prove that, contrary to the impressions given by that journal, the prevalence of wood construction and the shingle roof was largely to blame for the heavy toll taken by the fire.

And in proceeding with the proof in this case, it is the intention simply to lay before our readers the evidence as it has come to us and the testimony of a thoroly reliable representative who spent several days at the scene of the fire, in order that they might judge for themselves whether the statements made by the "American Lumberman" are true or not.



The Brick Dwellings Were Forced to Bear the Brunt of the Fire in a Seething Furnace of Flames from Nearby Frame Houses

In the first place, the following letter from a prominent citizen of Nashville, who is closely in touch with the insurance situation, is given below.

INSURANCE MAN CORRECTS MISLEADING STATEMENTS

I have for acknowledgment your favor of the 6th, requesting information concerning the recent conflagration in Nashville. Had the lumber journal referred to reversed its statement it would have been more nearly correct.

The Warner School at East Nashville, a Brick Building Which Was in the Hottest Part of the Fire and on Whose Steps Spectators Stood for a Time Watching the Progress of the Flames in Surrounding Structures

The fire originated in a frame woodworking plant and was fed by other frame buildings for several blocks before it reached the section that was built largely of brick buildings. The fire burned practically everything in its path for about two and one-fourth miles; the flames were fanned by a gale blowing fifty-one miles per hour.

The fire consumed approximately 648 buildings, classified as follows:

Frame, shingle roof	159
Frame, fire-resisting roof	180
Brick, shingle roof	1
Brick, fire-resisting roof	79
Frame stables, garages, outhouses	229
	648

Estimated property loss	$1,450,000
Insurance involved	925,000
Insurance loss	850,000

Fire burned a distance of 2¼ miles.

Fire burned average width, 1,250 feet.

It is the opinion of city officials that, had it not been for the frame structures, the fire would not have done twenty-five per cent. of the damage it did, and this opinion is concurred in by the public generally. Since the fire, the city commissioners have extended the fire zone ten or twelve blocks beyond the burned district. This will require the buildings destroyed to be replaced by material other than frame.

It is true that in three or four instances small frame dwellings were left standing by a totally destroyed brick, metal roof building, but this can be easily explained by direction of wind, relative heighth of the two buildings, with no openings in a brick wall, and favorable conditions for the firemen. The fire destroyed everything in its path, until there were no more buildings, and was not stopped within the bounds of frame structures.

Corroborating many of the statements made above, the official accounts of the Nashville fire as seen by Charles W. Schuyler, fire prevention commissioner of Tennessee, follows:

This fire started at the rear of property owned by Mr. P. S. Gordon, at 212 and 214 west side of First street, and laid to waste thirty-six blocks of mostly residence property. A three-room negro residence stood on the rear of 212, which was occupied by Lizzie Carter; a one-story and basement frame, iron-clad planing mill, 60 by 175 feet, stood at 214, which was occupied by J. M. Seagraves. This mill was not running, and had not run since the previous day.

There was no fire in the mill, nor had there been that day.

A three-phase induction motor furnished power to operate the planing mill.

The fire was discovered in the rear basement of the planing mill by an old colored woman by the name of Sallie McClain, who immediately gave the alarm; but the wind was blowing fifty miles an hour toward the front of the mill, and the dry pine building and pine lumber within was ablaze in a flash. With the terrific wind driving the flames like a forge, same was blown through the front of the mill and to the concrete street, blistering street badly and burning the poles which carried the electric wires. These poles were then consumed and the live wires fell, and at the same time the fire was communicated to three dwellings across First street, the conflagration which devastated a portion of beautiful East Nashville was beyond control of any human element.

SHINGLE ROOF THE GREATEST MENACE

One of the greatest hazards to the spread of fire is the wood shingle or combustible roof. Firebrands will fly, and when they light on dry, inflammable material ignition is certain, and this in turn throws off other firebrands to start other fires.

Another cause of the East Nashville fire spreading was the dry grass and rubbish in yards, light, wood fences and frame unprotected outhouses. All the above are spreaders of fire. From a distance, any house will burn from an adjoining fire.

Non-inflammable roofing material, fencing and outhousing can be had that will look as well, be purchased as cheaply and constructed as cheaply as wood, and no honest lumberman or contractor interested in the safety or welfare of his community will deny this statement.

Besides the danger from fire, if the yards are fenced with wire fencing, the premises will be kept cleaner, will be much more sanitary and decidedly more beautiful. Let us all "pull together" for a better, safer, healthier and more beautiful city and state.

The fire, driven by such high wind, jumped by leaps and bounds for many blocks at a time. In one instance, to my personal observation and knowledge, from north of the L. & N. Railroad to a house with a shingle roof south of Woodland street, a distance of at least nine blocks, a blazing ember fell on the dry roof, which flared up immediately, and as fast as the shingles were burned loose they were wafted over the comb of the roof and carried along by the wind to start other fires.

Much of the loss in Tennessee can be eliminated by safer construction and a reasonable amount of care.

The people are paying for the fire losses, and not the insurance companies. The insurance companies simply collect the insurance premiums and distribute the same to the insured who have a fire, and regardless of whether you were in the burned district or whether you own or insure property, you are paying your share for the clothes you wear from the time same leaves the sheep's back or the cotton field, and the food you consume from the time it reaches the markets until purchased by the consumer, is insured, and the greater the fire loss, the higher the insurance rate. You can rest assured that no insurance company, or any other kind of company, will continue in a losing business, and the premium is, and must be, based on the loss ratio. There are now forty-six of the large fire insurance companies not doing business in the state of Tennessee because the loss is so great here.

Statistical records show conclusively that eighty per cent. of the fires in America are preventable. This is a national shame. Tennesseans are a proud people; have, and always will, bear their share of the nation's burden, and there can be no better cause than the conservation of life and property. We have just been taught an expensive lesson in the art of carelessness; let us resolve that there shall not be a repetition of this great disaster in Nashville or Tennessee again.

Just think for a moment of the probable result should this fire have originated beyond Capitol hill in the warehouse district on Harrison street. There would be no Nashville to-day and the loss would have been inconceivable. Such loss is gone forever and can never be returned; it is that much of the nation's value wiped off the earth.

In conclusion, I want to commend the State, county and city authorities for their prompt action and aid to the distressed, and especially to Chief Rozetta and his brave firemen, who used splendid judgment in confining their energies to the side lines. The wisdom displayed in this movement saved equally as much property as was lost, and it seems an impossible feat to have kept the burned area so narrow.

VAMPIRE THREE

"Wind, water and fire, in this case:

FIRE SPEAKS

I am a vassal of man, and I do his will in many a marvelous way;
If he chain me, sure I am fain to endure his mastery night and day;
But should I escape from my dungeon red, to follow where embers fly,
I chasten my master with hell's disaster, and flaunt my head to the sky.

O. H. Roesner, in N. F. P. A. Magazine.

The above verse is a striking illustration of what occurred in the East Nashville fire. Generally speaking, all fires are the same size when they start. This brings to our minds in a very forcible way what a little match can do, and this great loss to Nashville and our citizens should in time be a benefit, for it has been shown that our property will burn as freely as that of Chicago, New York, Baltimore, San Francisco and other places, and will certainly cause the good people of Nashville, Tenn., and the entire South to practice and demand care in building from their neighbors.

WHY SOME WOODEN HOUSES ESCAPED THE FIRE

As has been already stated, what was judged to be a fifty mile gale was blowing during the fire. Another salient fact is that the brands, which were carried over from the original fire and dropped upon other buildings, were burning pieces of wood and the portion of the buildings which first caught fire after the valley at the railroad tracks was jumped, were wooden structures.

It is interesting to note that a row of frame tenement houses directly in its path, escaped the fire, the flames jumping right over them. The correct explanation of how this occurred has been made by a member of the Tennessee inspection bureau who calls attention to the National Fire Protection Association's publication on heat waves which are in advance of the flames. These invisible heat waves bring the property to a very high degree of heat, so that when the flames actually reach it and burn or break into the windows or doors, something which is practically an explosion takes place. These heat waves do not go down to the ground very frequently. Heat moves upward usually. The heat jumped the valley entirely, jumped the box cars and everything in the valley, creating a great suction and causing the cold air to rush upward. This served to help carry the heat waves clear to the first point they could strike on the neighboring hill. This explanation of the physical characteristics of heat motion is considered the correct explanation of why these wooden houses were jumped by the fire. Add to this, the fact that perhaps no burnings brands fell upon this first row of houses but were carried by the heat waves beyond, as that was their principal means of transportation, the reason why the fire jumped these wooden buildings is very clear.

It is a significant fact that, of the seven hundred buildings burned, the only portion left of a great majority was the chimney, fire-place and foundation which, of course, were of brick. Of the brick houses, the walls which are left standing are being prepared for use in new buildings.

Where the fire jumped the valley and began again, it began on wooden buildings and burned a distance of two, three and four houses before it reached a group of brick buildings. Paragraph five of the story from the "American Lumberman" contains a rank mis-statement, namely:

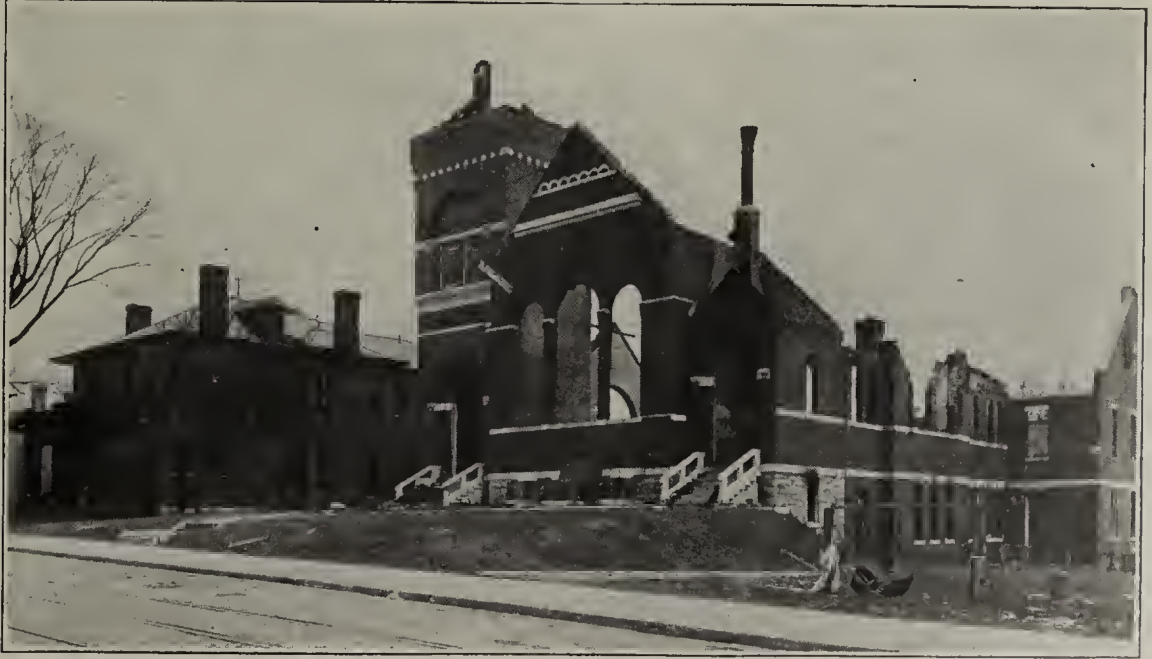
"Not a brick dwelling in this particular area of the fire zone escaped the flames, while many wooden cottages remained standing."

BRICK IN A FURNACE FED BY FRAME

There are brick dwellings with fire resistant roofs that to the eye of an observer now, were subjected to far worse temperatures than the wooden dwellings which escaped.. A remarkable and noticeable feature of the fire is that people could stand and did stand on the steps of a church and large school house that were burned, until the roof of the former, which was of slate, literally burst into flames all over from the excessive heat. The reason why they could stand there safely was due to the inrush of the surface air coming up and feeding the fire. They were as safe on the steps of these buildings as your hand is when you place it on the lower side of the grates of a boiler fire where, within four inches of your hand, may be a temperature of from sixteen to eighteen hundred degrees, yet the lower half of the grate is cool enough to let the hand rest upon it, due to the inrush of cold air. A match laid or thrown under the ordinary stove will frequently actually go out. According to our friends the lumbermen, this proves the fire resisting qualities of wood. The little cottages which escaped the fire were very small one-story structures which were below the level of the conflagration heat.

We will proceed no farther into the details of this phenomena which explains why some few wooden structures escaped, as it is not the purpose of "Brick and Clay Record" to try to show all the details but simply to prove that some of the statements which have been made regarding the fire resisting qualities of wood are entirely without foundation. Prominent men interested in fire safety in the state of Tennessee, who have resented the very peculiar position taken by the lumbermen's association and the lumbermen's club, have supplied us with the proper explanation of this unusual happening.

In this connection attention is called to the resolutions which were adopted by the Nashville Lumbermen's Club, above quoted. If Bill Nye and Artemus Ward were to be present now at Nashville and then read this resolution passed by the lumbermen's club, we believe that without doubt they would take the wreath of honor from their own brow and hand it to the lumbermen.



The Presbyterian Church, Which Withstood the Onslaught of the Conflagration Until the Tremendous Heat Caused the Timber Supports of the Slate Roof to Burst Into Flames. Note Brick House to the Left Unscathed.

It is noticeable that of the seven hundred buildings more or less, which were burned in this conflagration, the vast majority of them—more than eighty per cent.—were of frame. The lumbermen have stated in paragraph one that "it is a significant fact that the Nashville public is freely commenting upon the fact that everywhere the conflagration was stopped in the fire district at a wooden house."

This is, if possible, more humorous than the final resolution of the lumbermen's club, and as an example of human cleverness, we wish to call attention to it. The reason why the conflagration stopped in the fire district at a wooden house was that there was nothing else there for it to stop at. Along the lines which outline the burned district, stand two rows of wooden houses and the district that was burned was, as has been stated, more than eighty per cent. wooden structures. It is purely an incident that the line of the fire should have crossed the district which did include the brick houses. An interesting item is that one landlord owning a number of groups of one-story negro cottages, has made application to rebuild these of brick and has asked for the privilege of using eight-inch walls, as the National Board of Fire Underwriters' code permits in buildings outside of the fire limits.

It is another interesting fact that the people of Nashville know and can see that it was the wood in this district that is not to be found there any longer. It is all burned and the district has been taken into the fire limits, as have also considerable areas upon either side.

In closing the account of the Nashville fire, the following item from the Nashville "Tennessean" is of particular interest:

LOCAL PAPER CONDEMNS WOODEN SHINGLES

Spectators, as well as property owners, have been heard to say since the great fire that a number of houses in the path of the flames would probably have escaped destruction but for wooden roofs and ventilators. In a number of instances, those who observed the progress of the conflagration say they saw houses set on fire by sparks falling on the shingle roofs or passing through the ventilators that builders usually place under the eves or in the gables of dwelling houses. Whether these ventilators are really necessary in buildings of modern construction is debatable. In the view of some they are more ornamental than useful. But at any rate the wooden roof has come to be regarded by the public as a menace in time of fire like Wednesday's holocaust, especially in thickly populated districts. Spectators of the East Nashville fire declare their observations tended to convince them that those houses in the path of the flames having slate or metal toppings were slower to catch fire than those provided with wooden roofs.

The question is one, it is said, that sooner or later will invite the serious attention of architects and builders.

FLIMSY ROOFS SPREAD FIRE IN AUGUSTA

Greater, both in the value of property destroyed and in importance to the community than the East Nashville fire, the Augusta (Ga.) conflagration stands out as a monument to municipal heedlessness.

Thirty-two blocks in the business and residential sections of the city were destroyed, including 682 buildings, 569 of which were of frame construction, or frame, metal clad. The estimated loss is placed at $5,000,000.

Chief Reynolds of the Augusta fire department charges shingle roofs and faulty construction with the spread of the conflagration. He says that the fire did not jump Broad street, which is unusually wide, until the shingle roof district was reached.

About two weeks before the fire an effort was made to pass a new building code, and the lumbermen, being strongly organized, succeeding in inducing the city council to listen to their protests with the result that the anti-wooden-shingle ordinance did not pass. Fire Chief Reynolds was the only one protesting against the action taken by the council but his objections were overruled. It is interesting to note that the fire fully vindicated the contentions of the chief.

"Let's Build a Better Augusta" is a new slogan that is taking hold in that city and which will no doubt lead to the elimination of much of the flimsy construction that prevailed before the fire, sounding the knell of opposition to fire-resistant roofs and buildings.

Towering above both the East Nashville and Augusta fires, the conflagration that swept Paris, Tex., and which finished its work of destruction on March 22 was the worst fire in the history of the Lone Star State.

TREMENDOUS LOSS IN PARIS DUE TO WOOD

Like the other two southern fires, that at Paris is also attributed to the prevalence of the wooden shingle roof, this claim being strongly supported by S. W. Inglish, State Fire Marshal of Texas, who says:

"The burning of the business district of Paris was not due to a lack of fire fighters; it was not due to a lack of water; it was not due to the construction of the business district itself, but was primarily attributable to the wood shingle roofs of the residence district of the city.

The estimated property loss at Paris was $10,000,000, the burned district extending over 264 acres of territory in which 1,440 buildings were destroyed.

Clayworking Plants Idle in Wales

According to a report reaching government officials at Washington, D. C., since the war began the manufacture of fire-brick, and other clay products in Wales, has been reduced to such an extent that some of the plants have been closed for the present and, in some instances, it seems doubtful if they will ever be reopened. Generally speaking, the report states, that the cost of manufacture has advanced forty to fifty per cent. chiefly because of the greatly increased cost of labor. In normal times, there is an enormous demand for brick of various kinds for construction work at the colleries, including shaft linings, the erection of new industrial buildings, and for other purposes apart from that of building. At present there is practically no demand in these channels.

Louisville Finds Segmental Sewers Satisfactory

The use of segmental tile for sewer construction is receiving considerable attention in and around Louisville (Ky.) where a large amount of that kind of work has been done. One of the first of the jobs was performed in Oakdale, a suburb, just south of Louisville, where three sections were laid, one fifty-six inches, one forty-eight and another forty-five inches in diameter. A right angle curve was built in the fifty-six-inch section and, altho the work was handled under difficulties, due to the character of the ground, the segmental tile construction has proved entirely satisfactory. Since that time the county has done some of this work and the city as well.

H. A. Walters, manager of the brick department of the United Fuel and Supply Co., Detroit, reports a good spring business with a splendid outlook for the remainder of the year. "All manganese brick are up on price, but other face-brick prices seem to be holding to last year's mark," he said. "We are not losing any business because of advances in price—the demand being so brisk that builders are more anxious to know whether they can secure brick rather than what it costs."

The Metropolitan Brick Company, Canton, Ohio, has been awarded the contract for furnishing Battle Creek, Mich., with 10,000 square yards of paving-brick for the coming year.

HURRY *for the* ESSAY CONTEST

Time is Short and Should be Utilized in an Immediate Registration and the Preparation of the Best Possible Paper

ONLY thirteen days remain in which registrations may be made for the competition covering the writing of the best paper on a clayworking subject, for which a prize will be awarded to one student in each of the universities and colleges supporting a course in ceramic engineering.

It has been found that, owing to the proximity of the contest closing date to the commencement exercises in many of the ceramic schools, some of the students will not be able to take part in the competition because of the large amount of work to be accomplished before June 15 in order to graduate. Regrettable as this may be, it is an advantage to those who are able to participate, in that it cuts down the number from which the winners will be selected.

All students are, therefore, urged to register at once no matter whether they may be freshmen, sophomores, juniors or seniors.

Regarding the presentation of graduation theses for consideration in the award of the prizes, it has been decided that, where the faculty is willing, these may be entered provided this can be done before the closing date, which is June 15. In order that graduating students may not be debarred from the contest because their theses will not be available, it is suggested that a separate paper on a different subject be prepared and submitted, if the student is able to do this within the time allotted.

Above all, do not delay registering or advising the professor in charge of the ceramic work at your school that you intend to take part in this contest.

DETAILS OF THE CONTEST

Who Are Eligible—All Students Enrolled in a Course of Ceramic Engineering at the Various Universities and Colleges in United States and Canada.

How to Participate—Prepare a Paper on a Clayworking Subject and Submit it to "Brick and Clay Record" Thru the Proper Authority.

The Prize—A Membership in the American Ceramic Society, Which Includes the Payment of the Initiation Fees and One Year's Dues. One Prize is Allotted to Each Ceramic School.

ALL REGISTRATIONS MUST BE IN BY MAY 15.
CONTEST CLOSES JUNE 15.

Burned Clay Sewer Pipe Wins Sweeping Victory

Possibly one of the biggest defeats that burned clay sewer-pipe has ever administered to cement was realized recently at Long Beach, Cal., when, after a hot contest between the two materials, lasting many months, the local commissioners, acting upon the city engineer's findings of net percentages on cement and clay petitions, awarded to clay sewer-pipe the victory in every lateral, the material for which had remained undetermined. In all of the thirteen districts under consideration, the clay product received the preference by a decisive majority, with the exception of one that went to cement with but a very small plurality.

Cleveland Brickmakers Deny High Prices

A denial that existing high prices for brick, clay products and similar materials are responsible for the falling off in building operations in Cleveland, Ohio, has been made by clay products manufactures and dealers of that city. It seems that the blame for a slump in construction had to be placed somewhere, and the prices on materials were accordingly attacked by certain interests. "Prices are not abnormal for this time of year," says R. L. Queisser, of the Queisser-Bliss Company. "Comparison of figures named in Cleveland with those of last year at this season will show little difference in more than twenty materials. In fact, in most instances, prices are identical with those of a year ago. About the only significant change recently, has been the advance of common-brick about one dollar per thousand. This increase is due to the natural growth in building operations. Any slump in building activity during the past few weeks has been due to bad weather, I should think, more than anything else."

Detroit Manufacturers Buy Chicago Brick

Increased building activities and the shortage of labor have made it necessary for Detroit brick manufacturers to place orders for from 3,000,000 to 5,000,000 brick with Chicago plants in order to properly take care of their local trade, according to Secretary William B. Wreford of the Detroit Brick Manufacturers' and Dealers' Association.

"The demand for brick has grown until it now exceeds the capacity of the local plants," he states, "but we have made arrangements with outside firms to supply all our customers temporarily. The outside order will take care of the situation until June 1st, by which time the installation of additional machinery, now being installed, will have increased the capacity of Detroit plants, 65,000,000 brick annually. With the added equipment, Detroit firms will be able to make 365,000,000 brick annually."

Mr. Wreford believes the 1916 building permits will exceed those of 1915, as is already indicated by the large amount of building contemplated and in course of erection. Among those being built at present are the new addition to the Ford Motor Company, costing $800,000, the Elks Temple and several hotels. A new plant for the Cadillac Motor Car Company, the new million-dollar Finance office building, the Masonic Temple and numerous factory additions are also soon to be erected.

Prices to be Advanced on Imported Pottery

It has become known among domestic pottery manufacturers that the selling price in the United States of English imported ware is to be advanced before long, and it is declared that twenty-five per cent. will be added to all invoices. Just when this new advance is to take effect, is not known. Within the past year, the prices of imported dinnerware and specialties have made several advances, and that another is to be added, is not at all surprising, especially to buyers. On the other hand, domestic manufacturers have only added five per cent. to their invoices, and buyers contend that ten per cent. should have been added. While no official announcement has been made concerning the matter, it is generally conceded that an additional five per cent. will soon be asked for pottery articles should the cost of raw materials continue to advance as rapidly as has been the case during the past three months.

American Clays in Paper Making

Several interesting facts regarding the possibility of using American clays in the manufacture of paper were brought out at a recent conference between representatives of clay-mining companies and of the United States Bureau of Standards, which had been arranged for the purpose of discussing the status of imported and domestic clays in this industry. It was shown that several mills in this country were using American clays with excellent results, while several others making the same grade of paper had never been able to use anything except imported clays.

The facts indicate that part at least of the criticism of domestic clays is due to prejudice in favor of the imported article. Foreign clays are said to have a much whiter appearance than the domestic, yet it is definitely known that many imported clays are treated with ultramarine blue, giving them an artificial effect.

Representatives of the clay companies offered to supply all of the American clays that would be needed by the Bureau of Standards in its investigation, and also offered the assistance of any of their representatives and their fullest co-operation in general. Several lots of the products of their largest mines are to be sent to the bureau. Samples of the best English products will be obtained for comparison.

It is proposed to make runs on the paper machine to determine the difference in rate and amount of settling-out of the clays, and to make tests for color, per cent. of grit, ease with which the clays mix with water, and other experiments which will be devised to determine such characteristics as have a bearing on the problem.

At the same time that this meeting was held, there was a conference with a large manufacturer of graphite crucibles, which was confined to the discussion of bonding clays used in this industry.

Kentucky Students to Lay Out Sewer Systems

A number of the smaller cities in Kentucky have learned with interest of the offer of the senior class of the College of Engineering, University of Kentucky, at Lexington, which proposes to make surveys and prepare plans for sewerage systems without cost to these municipalities. The work is to be done as a part of the course, the students spending the greater part of May in the field and preparing the plans in the class room under direction of the teachers. Henderson, Ky., has taken advantage of the offer and it is expected that other towns will do likewise. This would enable the cities to put more money into the materials to be used in the work, and the sewer-pipe manufacturers would be interested in seeing this developed. Another state-aid matter is the application of Harrodsburg, Ky., for assistance in the construction of a city street which will form a part of the inter-county thorofare. This is the first time that an incorporated town has made such application and a ruling is awaited with interest. If the position of Harrodsburg is sustained, the state will shortly be helping to build brick streets, it is stated.

Michigan Becomes Strong Face-brick Competitor

The Briggs Company of Lansing, Mich., will take over the sale of the entire output of the Baker Clay Company, Grand Ledge, Mich. George P. Anderson, salesmanager of the Briggs Company, will have the management of the Baker Company's sales. In Michigan building circles the move is considered significant since the Briggs Company thru the acquisition of the Grand Ledge plant, will place that state in competition with Indiana, Ohio, Pennsylvania and Illinois in the manufacture of high-grade face-brick. With the exception of a small factory in Bay City, Michigan has left the manufacture of face-brick to other states. The Baker Clay Company is equipped to produce 15,000,000 brick a year, while its land holdings assure a supply of clay and shale sufficient for the next fifty years. The plant was built about twelve months ago and now employs seventy-five men. The company has manufactured silo blocks, sewer-pipe and common-brick, but these lines will be abandoned and the capacity devoted exclusively to the manufacture of face-brick beginning May 1.

Pacific Coast Pottery Duplicates Moorish Tile

One of the largest industrial establishments in the vicinity of San Diego, Cal., is the plant of the California China Products Company at National City. This is a very large factory which specializes in the manufacture of vitrified tile. The management has succeeded in duplicating on a commercial scale, for the first time in the United States, a colored tile of a Spanish or Moorish type with its wonderful lustre and color. This has revolutionized the mission style of architecture by substituting the Spanish-Colonial type. Bright colored Moorish tile are used for interior and exterior decoration. This concern manufactured four thousand feet of heavy matt glazed tile which were used on the floor of the New York State Building at the Panama-Pacific International Exposition, San Francisco, Cal. Some of the circular plaques which were set in the floor of this building, it is reported, will be removed and placed in the state capital at Albany, N. Y.

Detroit Brickmaker "Boomed" for Mayor

Chas. H. Bryan, a Detroit brick manufacturer, is the choice of his friends for the next mayor of Detroit, this fact having been brought to light at a dinner held recently by the Builders' and Traders' Exchange. Mr. Bryan, who is a member of the Mercier, Bryan and Larkins Brick Company, and who is prominent in the clayworking industry, has enjoyed considerable municipal distinction, having been appointed by the present mayor as a member of the lighting committee. He also holds a position in the local Chamber of Commerce.

THE DESIGN *and* CONSTRUCTION *of* CONTINUOUS KILNS

Some Clarifying Notes on a Much Misunderstood Piece of Clay Plant Equipment Which Had Its Origin in Europe

By A. F. Greaves-Walker

Author of "The Design and Construction of Down Draft Kilns," "Setting Down Draft Kilns," "Running a Plant to Capacity" and "Dies for Hollow Ware."

(*Continued from April* 18 *Issue.*)

THE PARTITION WALLS, or the walls which divide the chambers, present no difficulties in the coal-fired kiln. They need not be very heavy, 22½ inches being sufficient. Their principal duty, aside from separating the chambers, is to support the crowns. As they are simply middle walls with a crown springing from each side, the thrust is equally balanced and need not be considered.

In the case of the one side gas-fired chamber kiln the conditions are different, however. In these walls are built the gas "down-takes" leading from the distributing flues, which flues are built between and parallel with the crowns. These "down-takes" are usually nine inches square and open at the bottom into the bag walls. Extreme care is necessary in the construction of these walls, or gas-leaks into the chambers, thru the brickwork, will cause serious annoyance and partial loss of control of the gas at the burners.

The only safe method of constructing these small flues in the walls is by the use of tongue and groove brick which are shown in Fig. 12. These brick, which are made by all the large refractory manufacturers, are provided with a tongue and groove much like ordinary flooring, and with them a *perfectly gas-tight joint can be made.* They have been used by the by-product coke oven builders for all gas conveying flues for years past, with excellent results. As yet, gas-fired kiln builders have not used them with the result that gas-leaks from built-in flues have been a serious drawback to kilns of this type.

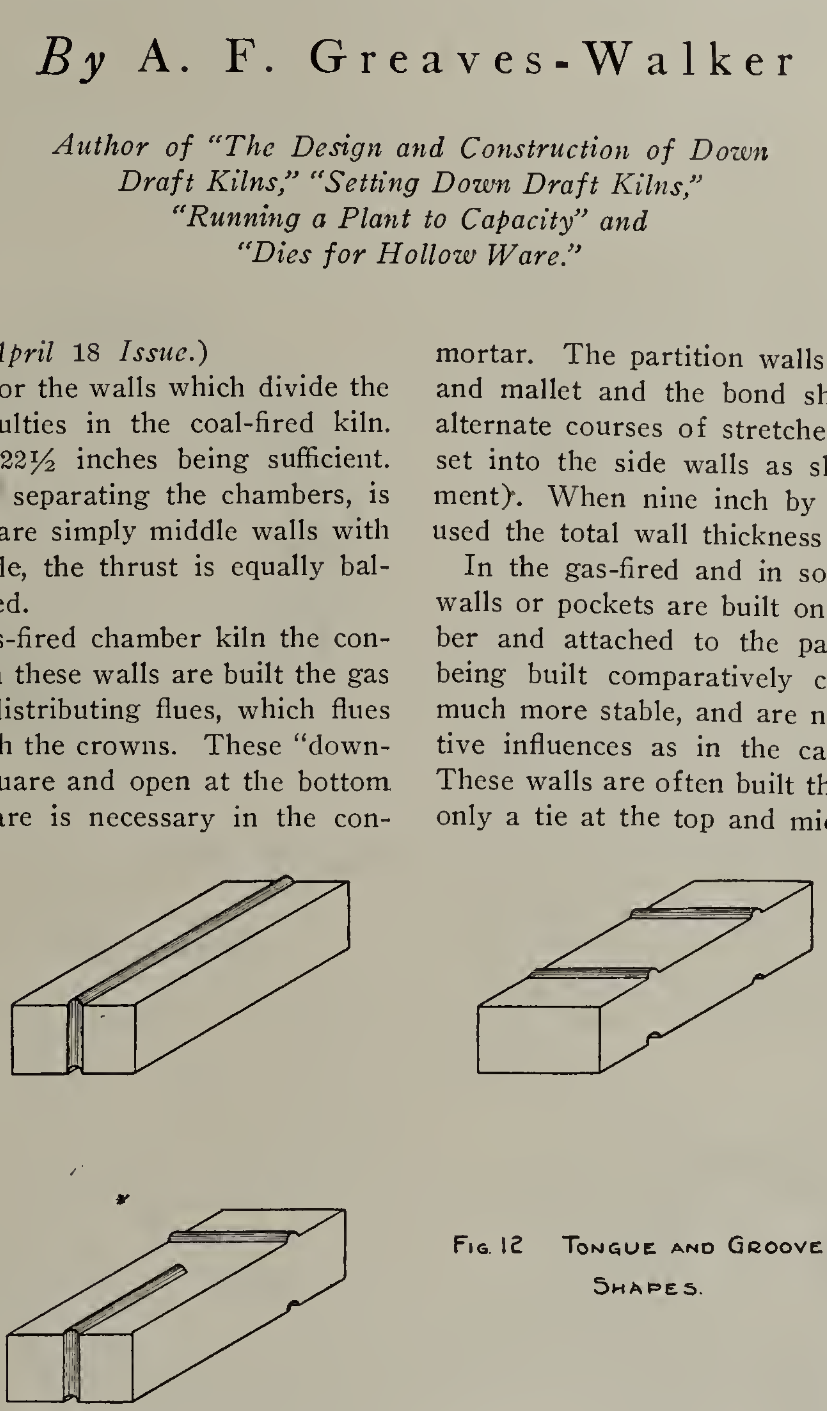


Fig. 12 Tongue and Groove Shapes.

As the partition walls are built up, the "down-take" flues should be carried up separately, as the tongue and groove brick will not bond with the standard shapes. This is really an advantage, as a crack, that might develop in the flue wall, would not then extend thru the partition wall proper. The flue walls need only be four and one-half inches thick and, as tongue and groove brick are made very exact in size on account of the nature of their use, they should be dipped in the mortar. The partition walls should be laid up with a trowel and mallet and the bond should be the same as the lining, alternate courses of stretchers and headers. They should be set into the side walls as shown in Fig. 9 (see last installment). When nine inch by nine inch "down-take" flues are used the total wall thickness should be thirty-six inches.

In the gas-fired and in some coal-fired chamber kilns, bag walls or pockets are built on one or both sides of each chamber and attached to the partition walls. These bag walls, being built comparatively close to the partition walls, are much more stable, and are not subjected to the same destructive influences as in the case of bags in the periodic kiln. These walls are often built the full length of the chamber with only a tie at the top and middle on each side of each burner or pocket. This is very poor practice. In such cases the flame is readily pulled to hot spots in the chamber, being carried along behind the continuous bag wall before it reaches the top. Thus the operator has difficulty in regulating the kiln. The bag wall may be built as a continuous wall, but it should be thoroly tied into the partition wall from top to bottom by means of four and one-half inch partitions placed between each burner or pocket as in Fig. 13. In some cases each burner or pocket is provided with an individual bag wall completely surrounding it. The face of a long bag wall should be nine inches thick and should be alternate header and stretcher courses. Bag walls in these kilns, when properly built, will last for years with only minor repairs.

FLUE CONSTRUCTION

The construction of flues in and around a continuous kiln is a problem of considerable magnitude insofar as making them trouble-proof is concerned. Many of the flues are very difficult to get at and repairing them is not an easy matter. In constructing a kiln, even from plans of good kiln engineers, this question of get-at-able-ness should be thoroly considered. It must be remembered that the kiln engineer is generally thru with his part when the kiln is complete. He is seldom, if ever, called upon to undertake the repairs which may be necessary a few years later. Very often a practical clayworker with his experience with other types of kilns, can improve vastly on the ideas of the engineer when it comes to a question of flue location. The design of various flues is also important. Many kiln builders have only one idea in mind in designing a flue, no matter where it is located, and that is that the half circle arch is the strongest that can be built. This idea is perfectly logical when the flue has to carry a heavy load, or is located underground where it will be subjected to the bumping of carts or wagons. In cases where flues do not carry loads but are subjected to a thrust which tends to crush their sides in, the half circle arch is unquestionably weaker than one that is more flat. Experiments have shown that, for flues subjected to a thrust, the rise of the arch should be one-third the inside width. Such an arch acts as a brace for the walls and will keep them in place.

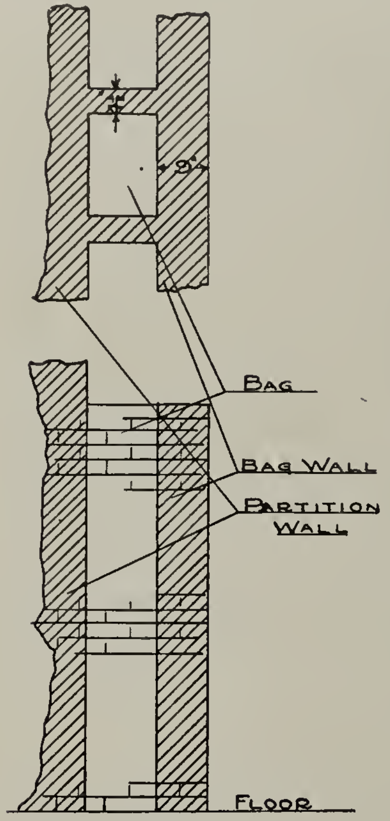


Fig. 13 Bag Wall

Continuous kiln experts generally advise placing flues as low in the body of the kiln as possible. This has a tendency to make them less accessible, but at the same time less likely to be damaged by constant expansion and contraction. In the coal-fired kilns the only flues used are the main draft flues with its connections, and the watersmoking flues when provided. These flues offer no constructional difficulties and may safely be made part of the brickwork which surrounds them. Extra care should be taken when connecting one flue to another so that no break will occur. Care should also be taken, as in the case of all flues, to use the exact arch, wedge and square shapes required to make a perfect arch. The use of squares alone will invariably lead to trouble and repairs. Provision should be made for getting into the main and watersmoking flues at various points for examination and repairs. It is no easy matter to have to tear out part of a wall or crown, or to remove several feet of filling, perhaps at a point where no trouble exists, to make a minor repair. Manholes, giving access to these flues, can be left so as to make it an easy matter to get into them.

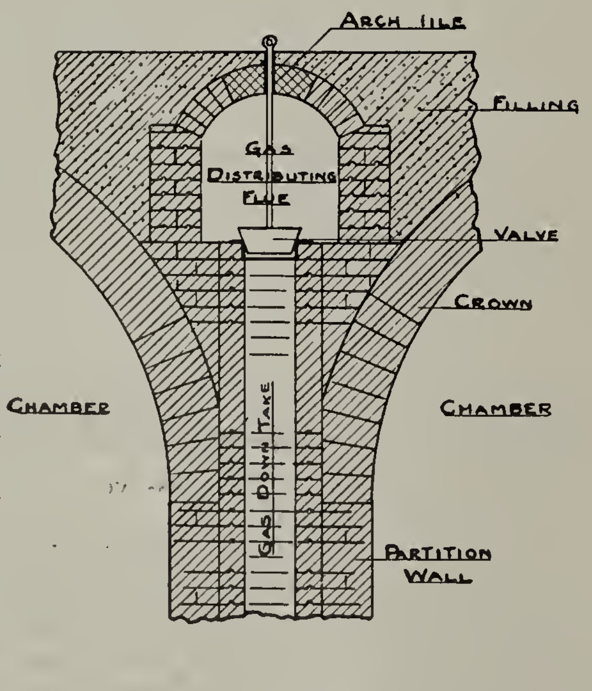


Fig. 14 - Section Thru Gas Distributing Flue and Down Take

A very different problem confronts the builder of a gas-fired kiln. In kilns of the latest design, all of the gas and watersmoking flues are carried in the walls. In the older models of the chamber type, the main gas flue and watersmoking flues were carried on top of the kiln. These flues were of steel with a fire-brick lining. This prevented loss of heat and gas-leaks, and as they could expand and contract freely without reference to the kiln, they gave absolutely no trouble.

BRICK GAS FLUES HARD TO BUILD

Carrying gas in brick flues which are subjected to considerable racking is a ticklish proposition, the construction of such flues requiring the best kind of engineering and workmanship. The conditions in a kiln are entirely different from those in a by-product coke oven where brick gas flues are used very successfully. In the latter case the temperature surrounding the flues is practically constant and consequently the walls are not cracked, but in a kiln the temperature fluctuates with the location of the fire.

The walls of the main gas flue, which always runs the full length of the kiln, should be built of *tongue and groove brick*, should be nine inches thick, and have alternate header and stretcher courses. The floor of the flue should not be tied to the wall on which it rests but should be free. The arch should be built with extreme care and with the joints as thin as possible. *The walls of the flue must not be tied to the brickwork on each side.* This brickwork should be run up on each side of the flue with a straight, close joint, *without mortar* between it and the flue. If the flue is to be entirely surrounded by brickwork, that is, placed low down in the body of the kiln, another arch should be thrown over the flue arch, but entirely separate from it. Such a flue will be entirely free to move without reference to the adjacent brickwork, *and it must be free* if it is not to be a constant source of trouble and expense.

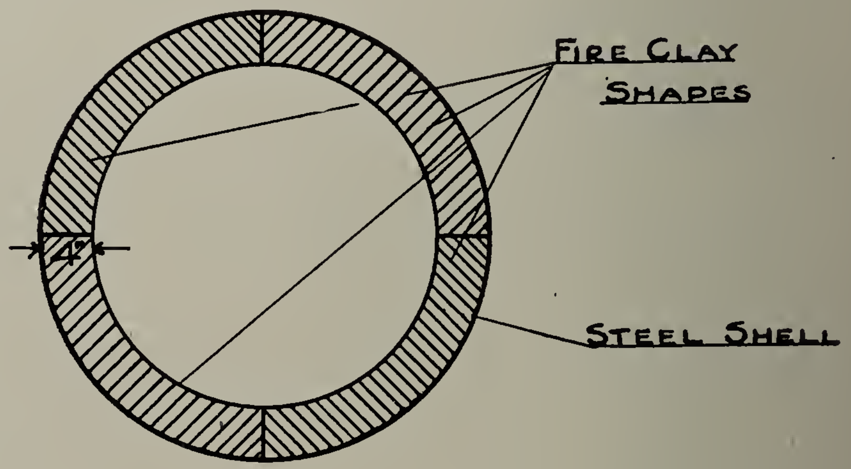


Fig. 15 Method of Lining Gas Flue

HOW TO CONSTRUCT WATERSMOKING FLUES

The watersmoking flues, when built in the body of the kiln, must be constructed in exactly the same way. As a general rule, no great pains are taken with these flues because they carry only hot air, but when poorly constructed, are often more of a nuisance than a help on account of the air leaks. Some watersmoking flues have been so poorly built, in both gas and coal-fired kilns, that their use has been entirely abandoned.

The distributing flues in a gas-fired chamber kiln are very often the source of a great deal of trouble. They are at right angles to the length of the kiln, so are not subjected to the same racking as the main gas flues, but receive a movement due to the hot gases within them and to the rise and fall of the crowns on each side. These flues are supported on the partition walls and must be made part of them, as from twelve to eighteen "down-take" flues are led from tne bottom of each flue, thru the partition walls, to the burners. Usually the earth filling which covers the crowns, completely surrounds the sides and arch of each flue, so that they are free to move. When not carefully constructed they can cause much trouble and annoyance thru the gas leaking into the chambers and causing a loss of gas control.

TONGUE AND GROOVE BRICK MAKE TIGHT WALLS

These flues should be built of tongue and groove brick and should be nine inches thick. Brick should be dipped and malleted. The arches are particularly important. The gas control valves seat in the bottom of these flues and the valve stems extend up thru the arches by means of small holes. It is quite common for these stems to "freeze" in the holes thru an accumulation of tar around them. In such cases, it often takes all of a man's strength to pull them loose and, in doing this, the arch key is loosened, as the pull is directly with the key. In course of time the arch is loosened to such an extent that it must be rebuilt. This difficulty is entirely overcome by the use of large key blocks instead of ordinary arch or key brick. These blocks should be large enough and heavy enough to resist any ordinary pull against them. They are shown in Fig. 14.

When lining metal flues, it is far cheaper to have special circle blocks made that fit the steel shell exactly than to use brick. To line up a steel tube from one hundred and twenty-five to two hundred feet long with nine inch shapes is an enormous job and, when finished, is more often than not something of which to be ashamed. A mason cannot do good work with small units while sitting down or lying on his stomach, especially by lantern light. When quarter circle blocks of the correct circumference are used, they can readily be slipped into place without mortar and a good permanent job results. See Fig. 15.

ROLLERS PERMIT EXPANSION OF METAL FLUES

The expansion of metallic flues is taken care of by means of rollers which allow the flue to work back and forth freely. Special care should be taken at the points where these flues make a right angle turn. At such points two sets of rollers with a plate between should be provided in order that the flue may move in both directions. These rollers are laid at right angles to each other as shown in Fig. 16. Four two-inch steel balls laid between two plates will answer the same purpose as in Fig. 17.

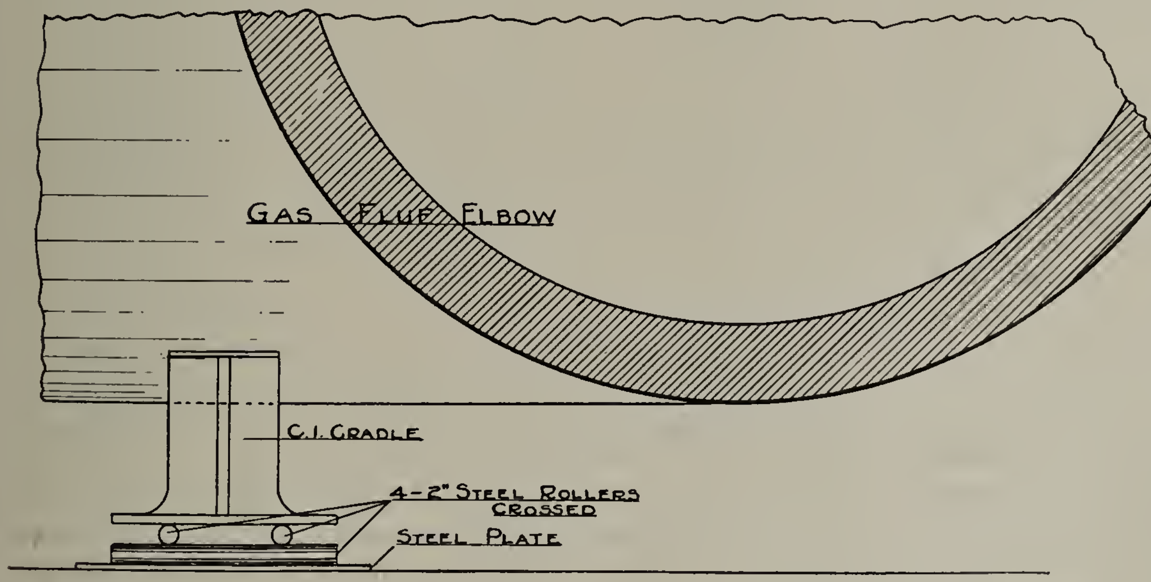


Fig. 16 – Method of Taking Care of Expansion in Two Directions at Flue Elbows.

Where a metallic flue enters a brick flue, provision must be metallic flue is tied into the brick flue it will quickly destroy made to take care of the expansion of the former. If the the connection and often cause considerable damage to the surrounding brickwork. When the brick flue continues in the same direction as the metallic flue the latter should extend into the brick flue and be allowed to slide back and forth in it. The joint is then mudded over when necessary. When a horizontal metallic flue is connected to a vertical brick flue, the bottom of the metallic elbow should be built with a wide flange. This flange should simply rest on the walls of the brick flue so that it may slide back and forth freely. In this case also the joint is simply mudded tight when necessary or closed with a sand seal as shown in Fig. 18.

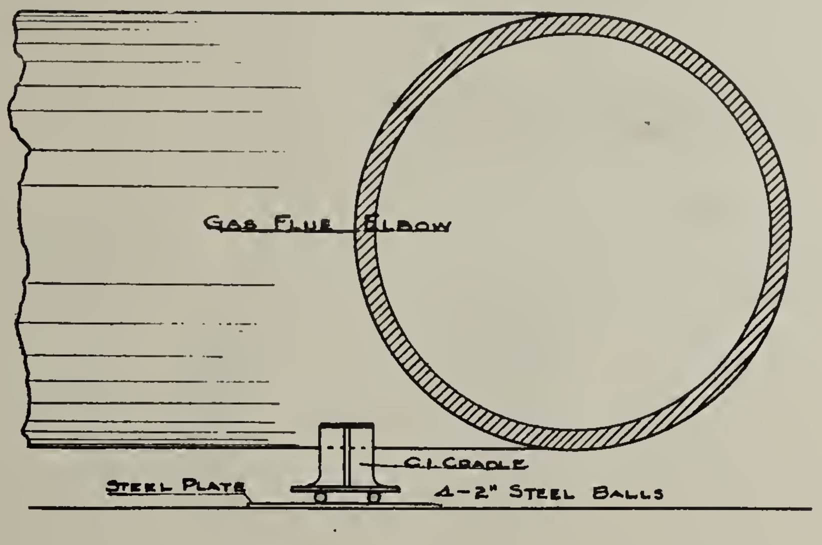


Fig. 17 – Method of Taking Care of Expansion in Two Directions at Flue Elbows.

BUILD UP-TAKES SEPARATE FROM KILN WALLS

When vertical brick flues or "up-takes" are built to convey gas from underground flues to flues in the upper part or on the top of the kiln, they should be made *entirely separate from the kiln walls.* Such flues are often heated to fairly high temperatures, especially during a "burn out," and they must be allowed to expand freely. They should be built eighteen inches thick with alternate courses of headers and stretchers. The corners should be fitted with three-inch angles for the entire height and these angles should be tied together every three feet with seven-eighths of an inch iron rods. The interior four and one-half inches should be of second quality fire-brick laid up in a mixture of fire-clay and shale, the balance of the wall being laid up in a three to one Portland cement mortar. The fire-brick in the lining should be hard and the joints thin. Producer gas has a tendency to "rot" soft brick and fire-clay mortar, and will destroy a flue in a few years, if the proper precautions are not taken.

Underground flues, with the exception of gas flues, serve the same purpose in both coal and gas-fired kilns. They are generally confined to main draft flues and "cross-over" or "return" flues. The latter are used to carry heat from one tunnel to another or from one end of a battery to the opposite end. These flues, being generally subjected to yard traffic, must be built with a high arch, preferably a half circle. Two points must be particularly borne in mind in constructing these flues—they should be as tight (free from leaks) as it is possible to make brick construction, and they must be very strong to carry the load.

The draft flues are not subjected to high temperatures and, therefore, may be built of common-brick. The "crossover" or "return" flues are seldom subjected to more than 1,400 degrees Fahr., so that as a rule common-brick with a high melting point will serve for them. The best wall for all underground flues is one thirteen inches thick, with a header and stretcher on each course, the header being reversed on every course so that it is outside on one and inside on the next above as in Fig. 19. This bond breaks the vertical joints in such a way that none of them go thru the wall. The draft flues should be laid up in three to one Portland cement mortar entirely, while the heat flues should have the inside four inches laid in clay or shale mortar and the outside nine inches in Portland cement. All joints should be as thin as it is possible to make them.

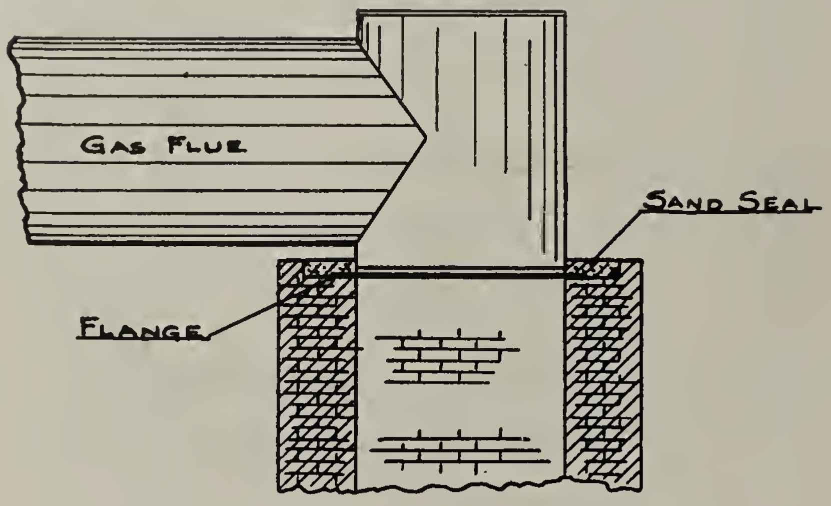


Fig. 18 Elbow on Brick Flue

EXPANSION JOINTS NECESSARY IN CROSSOVERS

When it is necessary to build "return" or "crossover" flues over fifty feet long, as in the case in the single battery kiln, or when two batteries are widely separated, expansion joints in the flues should be left every forty to fifty feet. If this is not done, the flues will wreck themselves in a few months, to say nothing of the effect on transfer tracks and pavements above them. This also applies to long underground gas flues which expand greatly when being "burned out."

When digging a trench for an underground flue it must only be wide enough for the flue to fit snugly. To follow the usual custom and dig a wide trench and afterwards fill along the walls with loose earth invariably results in a wrecked flue, for as soon as weight is put upon the arch the walls spread and the key of the arch is gone. More continuous kiln trouble results from air leaks in flues and walls than from all other sources combined, and many unsuccessful or partially successful kilns would work perfectly if the leaks could be stopped. An instance of this is a kiln which required two fans operating to capacity to get the required draft. The flues and walls, which were poorly constructed, were gone over thoroly. Repairs were made and leaks daubed up, with the result that one fan running three quarters speed gave sufficient draft and increased capacity.

Underground gas flues should be built in the same manner as other underground flues but should have a double arch, the upper ring being laid in cement mortar. On top of this arch a covering of sand several inches thick should be laid as a seal for the gas.

All underground flues should be completed before the main body of the kiln is put up. A number of serious collapses have taken place thru making excavations for underground flues in close proximity to the kiln walls after the kiln was well along. The weight of the kiln simply pushed the footings out as soon as the solid earth backing was removed in digging the trench. As some of the flue excavations are quite large and as the flues may as well be put in first as last, it pays to take no chances in this direction.

REGARDING THE CROWN OF THE KILN

The crowns are comparatively the most expensive part of the ordinary continuous kiln and it pays well to so construct them that they will be permanent. It has been the custom to build all these crowns as a half circle, on the supposition that such a crown had the greatest strength. This idea would have been correct if the load on the crown was the only consideration. However, it is the fire under the crown and the expansion that must receive first consideration and, on this account, the idea of the half circle crown has had to be revised. Another consideration is the kiln capacity. In both the tunnel and chamber types where the half circle crown is the tunnel and chamber types where the half circle crown is used, the skewback has to be set so near the floor line that the benches of ware commence battering after the first few courses. This not only cuts capacity, but makes the setting more expensive.

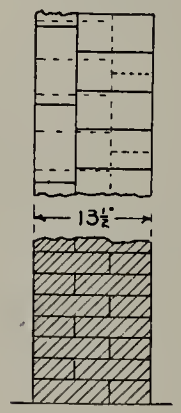


Fig 19 Flue Wall Construction.

Experiments have shown that the same rules apply in continuous kiln crown construction as in rectangular down-draft construction. This means that the best crown has a height equal to one third the width of the tunnel or chamber. Such a crown not only gives good capacity, but the best burning results.

(To be Continued)

Research Work in English Potteries

It has been known for some time that negotiations were proceeding between the governing body of the Pottery and Mining Schools, Stoke-on-Trent, and the committee of the privy council for scientific and industrial research, for the establishment of research work into the manufacture of hard porcelain, success in which, it is hoped, would better enable British manufacturers to compete with German feldspar china. A check for £1,000 ($4,866) has now been received by way of interim grant, and a much larger sum is expected to be received when the full cost has been ascertained.

It is proposed to erect what will practically be an experimental factory on the land adjoining the Pottery and Mining Schools near Stoke Station, and exhaustive research will be undertaken there. The principal of the pottery school will act as director of research, and the services of a pottery expert have also been secured, with a committee of manufacturers acting under the authority of the governing body.

The importance of this announcement will be generally recognized, for experiments are thus rendered possible which could never be undertaken by manufacturers personally. A proposal has been submitted by the Institution of Electrical Engineers for an investigation into the properties and production of porcelain used for insulating purposes, and the advisory council of the privy council propose to put that institution in touch with the governing body of the Pottery and Mining Schools in Stoke-on-Trent.

Cleveland (Ohio) Guardsmen Out for a Trial Spin Over Brick Paved Roads in Motor Truck.

"Mobility Can Take the Place of Numbers Much Better Than Numbers Can Be Made to Take the Place of Mobility," Strikes Right at the Heart of the Situation as Regards Our National Defense. This, Together with Other Eye-Opening Statements, Pointing Out a Glaring Weakness, Make the Following Article on Roads by Major Bond, Well Worth Reading.

DEFENDING *the* NATION *with* BRICK

Not as Food for Cannon, But in Well-paved Highways Can Brick Play an Important Part in Protecting America's Shores

By Major P. S. Bond

THE USEFULNESS in war of a substantial system of highways can scarcely be overstated, but it can be misunderstood and frequently is. Our freedom from wars, during long periods, has made the term "military road" little more than an historical phrase in America. It calls to mind the Cumberland pike and suggests the conditions of military enterprise that gave rise to our constitutional provision for federal military roads.

Those conditions antedate the railroad. In the present state of affairs the longer hauls for the assembling of soldiers, munitions and supplies will almost invariably be made by rail. Military considerations do not call for long single lines of road thru the interior of the nation so much as for intensive systems of parallel and intersecting roads in the probable zones of actual warfare in case of attack by a foreign enemy.

To appreciate the tremendous usefulness of such road systems, it may be necessary to review some of the conditions of modern war as exemplified in Europe today. In speaking of innovations, I use the word with respect to popular American conceptions of war, which are still largely founded on the civil war of the sixties. The European war has really developed very few innovations, from the standpoint of the military student. Attacks by gas and liquid fire, effective as surprises, have been among these few. The general nature of the struggle was either anticipated by military men or actually demonstrated in the other wars of the last two decades. I wish particularly to refer to some phases of modern war with reference to the use of highways.

While less reliance than formerly is placed upon permanent fortifications, trench warfare between nearly equal forces tends to develop a condition of deadlock, in which the tactics are similar to those of a siege. Hence the routes of supply do not, under certain conditions, vary as much as in the old days of open fighting when one army would pursue another half across a continent on foot.

Not only are routes of distribution more nearly permanent, but the volume and weight of the traffic is such as to justify and require the most substantial kind of highways. Larger armies eat more food. Larger and more intricate guns consume immensely more ammunition. The British army in Belgium is said to have fired more shells in a single day than were used in the entire Boer war. These are transported from the railroad terminals to the place of consumption very largely by motor truck and the effect on any but the most substantial roads can be imagined.

Add to these conditions the mobility now required for very

A Beauty Spot on the Cleveland-Akron Road, a Part of the Excellent System of Brick Highways That Radiates from Cleveland, Reference to Which Is Made by Major Bond

heavy guns. It can be seen that the placing and replacing of ordinance weighing many tons per piece—the saving of guns in case of a sudden retreat—would be virtually impossible under the conditions that prevail on most American highways during long seasons, or would impose the heaviest possible tasks upon the engineering arm of the service.

We have pictures showing the kind of improvised roads upon which the resourceful Germans have been compelled to rely in Russia. They follow the principles of the old American corduroy road, with a foundation of stringers and transverse logs, on which are laid brush and dirt. The contrasting advantages of level durable road surfaces, prepared in time of peace with an eye to the exigencies of war, are so striking as to make comment unnecessary.

P. S. BOND
Major, Corps of Engineers, U. S. Army, and Member of the American Society of Civil Engineers

But the greatest advantage of motor trucks and suitable motor roads has yet to be mentioned. To appreciate it, one must bear in mind the broad nature of battle tactics. War is not unlike football. An army must hold the foe in check at all points on the line and relies for its success upon smashing attacks by the concentration of troops at some particular point. In the old days the plan of attack was often concealed from the enemy until the moment when it was sprung. Distance and natural obstacles to vision made it possible to work out a maneuver with comparative leisure. Today the hostile aeroplane hovers overhead and conveys prompt information of the concentration of any considerable body of troops at any given quarter.

To render such an attack effective, it is therefore necessary to make it a sudden attack, like the dash of the backfield in a football game. To be able to move a whole division by truck and auto to a critical point at a rate of twenty or thirty miles an hour would greatly facilitate both offense and defence. It is said that the battle of the Marne was won by the sudden concentration of French troops, using motor transport over the splendid chaussees of France, upon the German left wing.

One road will not suffice for this variety of tactics, altho one is better than none. The ideal would be a number of parallel routes traversing the line of battle, with frequent cross roads to permit the distribution of reinforcements at any desired point or points. In war, football or chess there is only one rule for success and that is to oppose a lesser force with a greater force at the crucial point in the conflict. This does not mean that the largest army always wins, for the largest army may have three-quarters of its numbers out of action thru lack of generalship or failure of transport facilities. Mobility can take the place of numbers much better than numbers can be made to take the place of mobility. When this fact is digested, the immense tactical value of paving can be better appreciated.

The motor can thus lessen the fatigue of forced marches and increase their possible radius five fold or more. It is also probable that motors will take over part of the work of transport formerly accomplished by rail. There is considerable necessary delay in entraining troops and getting a clear track for their movement, so much so that the old rule was to undertake movements of thirty miles or less on foot, as being prompter thas train service. With suitable roads and an abundance of motor vehicles, this line of demarcation might be placed at sixty or a hundred miles or more, depending on the particular circumstances of the case.

The unimproved highway is our weakest link today from the standpoint of military transport. America has the railroads. It has the autos and auto trucks. Whether the latter can be used, or whether we must go back to the age of the mule whacker and the dreary march rests with those who are responsible for our highway improvements. Any city within a hundred miles of our coast or frontier may some day be the base of military operations that will put its surrounding highways to the severest test. Very few would meet it creditably. Cuyahoga county, surrounding Cleveland, would offer a better opportunity for modern maneuvers than any similar locality with which I am familiar. The brick road, properly constructed, stands high in the estimation of army men for such purposes as I have been describing.

In a military crisis such a system of roads would much more than pay for itself in the saving of other forms of military expenditure. Considering also how they conduce to the wealth of the nation in times of peace, there seems to be no possible argument against this phase of preparedness.

NEW YORK *may combine* ANNUAL MEETING *and* SHORT COURSE

ALTHO THE ATTENDANCE at the ceramic short course held at the New York State School of Clayworking and Ceramics, Alfred, N. Y., during the week beginning April 17, was not large, those who attended were enthusiastic and thoroly enjoyed the sessions. The comparatively small number who elected to take advantage of the course was to be expected owing to the lateness of the date, which came at a time when most manufacturers are exceedingly busy with spring orders, and to the fact that a meeting of the state association was held in Syracuse in December, making two separate meetings within six months to be supported by the Empire State clayworkers. This proximity of meetings has led to the decision that it might be better in the future to combine the state convention and the short course ino one meeting, thereby securing a much larger attendance and a stronger organization.

The program as announced in the April 4 issue of "Brick and Clay Record" was carried out with the exception that it was condensed into a shorter period of time by holding evening sessions. In this way it was possible to complete the work outlined, by Wednesday afternoon, so that all who attended could get away that evening.

Those who registered for the course in addition to the professors who appeared on the program, were as follows: M. E. Gregory, Brick, Terra Cotta and Tile Company, Corning, N. Y.; Kirtland Marsh, Norton Company, Worcester, Mass.; John Fitzpatrick, Carborundum Company, Niagara Falls, N. Y.; J. J. Ruckno, Keystone Clay Company, Wyoming, Pa.; E. J. Lewis, Locke Insulator Company, Victor, N. Y.; A. J. Smith, Iroquois Pottery Company, Syracuse, N. Y.; F. Aitchison, Sun Brick Company, Toronto, Canada; O. S. Solem, Jewettville Brick Company, Jewettville, N. Y.

In addition to these a large number of students stayed in town for the lectures, which together with the delegates, made a fair-sized audience.

Those who are interested in the welfare of the industry in New York State feel that the events of the past year have been very encouraging and point to a bright future.

Road Experts Talk to Illinois Paving Brickmakers

Twelve members of the Illinois Paving Brick Publicity Bureau, which is composed of the leading paving-brick manufacturers of the state, met at a luncheon in the St. Nicholas Hotel, Springfield, recently as guests of Thomas J. Armstrong, president of the Springfield Paving Brick Company.

Wm. W. Marr, Chief State Highway Engineer, and Harry E. Bilger, Road Expert of the Highway Commissioner, were the guests of honor, both addressing the gathering on the best method of constructing brick highways, and the many qualities of the brick road that make it superior to any other type. Following the talks which were given by the experts, some matters of importance to the bureau were taken up and discussed, together with certain committee reports.

Good Roads Measure Adopted by Illinois County

The good roads movement chronicled its first victory in southern Illinois recently when on April 11, Edwards county carried a $160,000 bond issue for hard-surfaced highways by a large majority—in some cases the measure being carried by as decisive a majority as seven to one.

This action marks the successful consummation of a long and vigorous campaign carried on by the good roads enthusiasts of that county. It is the result of mass meetings and a strong editorial effort on the part of the local papers, besides a desire on the part of the farmers and all those using the roads to be improved, which are at present, for the most part, in very poor condition, that they be paved with permanent material.

It is estimated that this bond issue will provide for about thirty miles of paving. This will take care of the greater portion of the county's highways but is considered as only a forerunner to a more complete system of good roads.

The example set by Edwards county will undoubtedly have a good effect on the surrounding counties which have not as yet taken up the good roads movement.

Large Stock Reason for Temporary Shut-down

The Columbus Brick and Terra Cotta Company of Union Furnace, Ohio, whose plant, it was reported in the April 4, issue of "Brick and Clay Record," has closed for an indefinite period, reports that the reasons for this step are that the firm is unable to obtain the necessary manganese for the gray brick which it manufactures. This, together with the effects of the European war on the company's Canadian and southern trade, the rough winter and spring weather and the car shortage situation, have combined to produce a situation in which the plant was running at a loss. So it was decided to close the factory and devote most of the energy to disposing of the large stock of brick on hand. The reason for closing the plant, as originally reported—that of an unfavorable location—is in error, the present supension of operations being only a temporary one and due, as above stated, to conditions over which the company has no control.

The BURNING *of* PORCELAIN

What to Do and What Not to Do for the Successful Firing of This Important Pottery Product, Containing Some Valuable Information for the Maker of Cruder Clay Wares

By George H. Brown, Cr. E.

in a Paper Read Before the New Jersey Clayworkers' Association

IN GENERAL, the stages of burning ceramic products may may be divided as follows:

1. Water-smoking.
2. Dehydration.
3. Oxidation.
4. Vitrification.

The relative importance of the various stages of the burning is governed by the nature of the ware being fired. In the burning of whiteware and porcelain the water-smoking, dehydration and oxidation periods are of especial importance where large and heavy pieces are being fired.

After the most careful drying there is always present more or less hydroscopic moisture in the ware. This may be present as moisture which has not been driven out during the drying process or moisture which has been absorbed from the atmosphere by the bone-dry ware. The too rapid expulsion of this moisture at the beginning of the burn by too rapid heating may cause cracking of the ware. It is also important, especially where down-draft kilns are used, to burn with a good draft during the water-smoking period in order to avoid the collection of steam and subsequent precipitation upon the unburned ware, causing softening and disintegration.

DEHYDRATION PERIOD

During the dehydration period the chemically combined water is driven from the clay ware. Kaolins contain from ten to fourteen per cent. of chemically combined water, thus introducing into a porcelain or whiteware body from five to seven per cent. of the constituent. Laboratory experiments have shown this combined water to first be driven off at 450° C. (842° F.), at which temperature it is expelled, but very slowly, the last traces being driven out with exceeding difficulty. At 950° F. the water comes off more rapidly, and at higher temperatures the expulsion is accelerated. The better practice would appear to favor a slow heating from 842° F. to 1,100° F., the time required depending upon the size of the ware and the uniformity of the heat distribution in the kiln.

OXIDATION

In the burning of American whiteware and other white bodies the oxidation period is usually regarded as being of little importance, as any organic materials which may have been present in the raw materials are easily burned out. Potters, as a rule, pay too little attention to this point. Frequently, in the production of vitreous ware, many defects are due directly to neglecting proper oxidation. Slight swelling of the ware and spongy, poor structure is only too often to be attributed to failure to burn out all of the carbon from the ball clay of the body. The more ball clay the latter contains, the more important does this point become. Oxidation consists essentially in maintaining in the kiln a temperature of about 1480° F. with clean, thin fires which permit of maintaining in the kiln an excess of oxygen, so that the carbon may be burnt out of the body in the minimum amount of time. The temperature should not be raised until oxidation is completed. This may easily be observed by drawing out of the kiln trials of extra heavy pieces of ware and breaking them. The fracture must show no trace of grayish color. Such trials could be readily placed in the kiln, convenient for drawing. This practice would certainly be of benefit to all potters, especially those engaged in the manufacture of sanitary ware.

VITRIFICATION

The finishing temperature of the burn depends upon the kind of ware being produced and upon the raw materials and composition of the body and glaze. While with some materials there is considerable leeway as to the maturing temperature, in others the range is narrower and must be carefully watched. When the finishing temperature is almost reached, the temperature should be raised more slowly and held practically constant for sometime to allow for the completion of the fluxing action, both in the body and of the glaze.

The maximum temperature which may be produced by burning a fuel of given heating value can only be attained by a complete combustion of all the volatile gases and of the carbon of the fuel, the quantity of air admitted being just sufficient to furnish enough oxygen for the union with the carbon and hydrogen of the fuel. If insufficient air is introduced for this purpose we have so-called reducing conditions. If an excess of air is admitted we have oxidizing conditions. Thus, having a coal whose composition is such that it has a heating value of 11,160 B. t. u., the quantity of air necessary for theoretical combustion of one pound of fuel would be 7.66 pounds. Since, however, it is impossible to admit just the right amount of air for theoretical combustion of the fuel, we usually work with less or more than the required amount, usually the latter.

When the fire-box receives a proper charge of coal, combustion is most energetic, the percentage of carbon dioxide in the combustion gases is high and the air excess low. As the coal burns down the amount of volatile gases given off decreases and the amount of excess air passing thru the fuel bed increases, so that the carbon dioxide content of the combustion gases decreases with a subsequent increase of the oxygen, indicating a larger excess of air.

The content of carbon dioxide or carbonic acid gas in the combustion gases of the kiln is a reliable indication of the quantity of air being admitted. This may be determined by the use of a carbonic acid gas burette, or roughly by careful observation of the progress in burning. In gas-fired kilns it is possible to control very closely, without great variation, the amount of air excess in the combustion gases. The constant supply of fuel renders this possible. In firing coal as a fuel, if it were possible to charge the fuel at a uniform rate, as when mechanical stokers are used, ideal conditions would be more nearly approached and the carbonic acid gas content in the gases of combustion would be left more nearly constant, and a steady stream of combustion products carried into the kiln.

From this it follows that the common practice of firing heavy charges of coal and letting them burn down during a fairly long interval is inherently wrong. Smaller charges should be fired at more frequent intervals.

DISTRIBUTION OF HEAT LOSSES

The percentage of the heat produced by the combustion of the fuel actually used in the burning of the ware varies with the kind of ware being burned, the conditions of setting, firing, etcetera. It is interesting to know just what part of the heat is utilized and what part is lost. The distribution may be subdivided as follows:

(1) The heat used in the burning of the ware.
(2) The heat carried out by the waste gases.
(3) The heat lost in the ashes and uncombusted coal.
(4) The heat taken up by the kiln walls, saggers and lost by conduction and radiation.

The heat required theoretically to heat up a pound of dry clay containing two per cent. of hygroscopic moisture may be approximately calculated to be 500 B. t. u. Thus, if a brick should weigh six pounds, the heat required (theoretically) to burn 1,000 bricks would be an average temperature of, say, 2,010° F. would correspond to 3,000,000 B. t. u. Expressing this in terms of coal of fairly good quality possessing a heating power of 12,600 B. t. u. per pound, we would have 3,000,000 divided by 12,600, or 238 pounds of this coal. In other words, 238 pounds of coal should burn 1,000 brick weighing 6,000 pounds in the dry state. This would be equivalent to practically four per cent. of fuel in terms of the dry weights of the clay, or four pounds of the above coal to 100 pounds of clay. It is evident that this is far less than the total amount of fuel charged into the furnace, altho, in some European continuous and tunnel kilns, the difference between the ideal and total expenditure of fuel is surprisingly small.

It is obvious that much heat is carried out by the waste gases of up-draft kilns and down-draft kilns and that all of this heat is lost beyond recovery.

Accurate measurements made of brick kilns in this country by Prof. A. V. Bleininger show the amount of heat carried out by the waste gases to be large, altho not so great as might be expected. Measurements on a building-brick, paving-brick and sewer-pipe kiln showed that for every 100 pounds of fuel charged 27.3 pounds, 29.9 pounds, and 18.6 pounds respectively were used in heating the gases which passed out of the stack.

The more air is allowed to enter the kiln, the greater will be the amount of heat carried out by the waste gases. For this reason under ordinary conditions not more than twenty to thirty per cent. of excess air should be permitted on an average.

The question of utilizing this heat with periodic kilns is not an easy one and can only be done by employing the principle of the continuous or of the tunnel kiln.

The ashes falling thru the grates always contain more or less coal. Altho the amount may appear inconsiderable it frequently will be as high as five per cent. of the total heating value of the coal, i. e., for every one hundred pounds of coal five pounds are hauled away with the ashes.

In addition to the heat carried out by the waste gases and that lost thru the ashes, obviously a considerable proportion of the heat is lost by radiation from the kiln walls and carried away by convection. The loss of heat thru the kiln walls is governed by the thickness of the kiln wall, the difference in temperature between the inside and outside of the kiln, and the thermal conductivity of the refractory and other brick from which it is constructed. In order to reduce this source of loss as much as possible, a wall as thick as practicable should be constructed from brick having the lower thermal conductivities.

Also a considerable portion of the heat of the fuel is lost as residual heat stored in the kiln walls and the ware after the kiln is burned off.

The distribution of the heat of the fuel charged to a building-brick kiln in the investigation before mentioned was found to be as follows:

	Per Cent.
Heat lost by waste gases	27.33
Theoretical heat required	19.55
Heat lost by unburned coal in ashes	3.51
Heat taken up by the kiln and lost by radiation	49.61

It is evident that the amount of coal used in burning clay products varies enormously for different clays and plants.

The amount of the heat of the fuel actually utilized in burning whiteware and light materials is surprisingly low. Actual determinations have shown that in whiteware kilns the amount of the heat of the fuel utilized in burning the ware falls as low as five per cent., and even lower. This small efficiency in whiteware kilns over others is accounted for by the relatively small bulk of the ware being burned and the fuel required for heating up the saggers.

It is doubtful whether the present efficiency of the whiteware kilns can be improved upon by kiln design, firing, etcetera. An appreciable improvement can only be gained by the employment of the continuous or tunnel kiln. The French and Germans have realized this fact, and of late years have inaugurated the use of the tunnel kiln in the burning of porcelain. About one year ago nineteen tunnel kilns were in use on German porcelain plants.

The conservation of our fuel supplies demands that the tremendous waste of fuel on ceramic plants be reduced by radical changes in the types of kilns and more accurate control of firing conditions.

THE BURNING OF EUROPEAN PORCELAIN

In an investigation leading to the production from American materials of a body similar to the hard porcelain or chemical porcelain manufactured in Europe, difficulties were encountered in producing a ware whose whiteness compared favorably with ware of European manufacture. Invariably a dark-colored body was produced, the translucent pieces having a yellow tinge. Rewashing of the kaolins used in the preparation of the body did not appreciably reduce the yellow cast. The use of the whitest American kaolins and the elimination of ball clay from the body did not improve the color to the desired extent.

The test pieces were fired in down-draft test kilns. In the preliminary burns an excess of oxygen was present at all stages of the burning. Careful preparation of the raw materials of the body not having given the desired excellence of color, it was decided to pay more attention to the burning conditions, especially to the constitution of the kiln gases.

In the burning of hard porcelain in Europe reducing conditions are maintained in the kiln during certain periods of the burn. Reference to the literature on the subject, especially a paper by Dr. A. Heinecke, Director of the Royal Porcelain Factory, Berlin, appears to give the method of procedure about as follows.

As in the manufacture of whiteware and other ceramic wares, the burning is carried out in the two stages, biscuit and glost.

The biscuit burn of the hard porcelain is carried to about cone 09, the results attained being the expulsion of the remaining traces of hygroscopic moisture and the driving off of the chemically combined water of the clay substance. In addition, the ware attains strength sufficient to allow handling without breaking, and may be dipped in the porcelain glaze without softening.

In connection with the employment of a suitable kiln and fuel and of a body and glaze of the requisite physical and chemical properties, a clean white porcelain can only be produced by a careful regulation of the kiln gases during the glost firing. The glost burn may be conveniently divided into three stages, the heating-up period, the reducing period, and the vitrification or finishing period, which are discussed as follows:

The heating-up period extends from the beginning of the glost burn until the whole kiln and contents have attained a decided red heat; the reduction period from the beginning of the closing of the pore spaces to the beginning of the melting of the fluxing materials of the body and the vitrification period from this point to the finish of the burn.

HEATING UP

During the heating-up period of the glost burn the constitution of the combustion gases is of secondary importance. It is necessary, however, that the kiln contents be heated gradually thru and thru. Sufficient time should be allowed for drying. The condensation of moisture on the ware does not occur after the kiln and contents have reached a temperature of 100° C., therefore the temperature limit during which injury may be caused by the deposition of water and other compounds on the cold ware is exceeded in a very short time.

Defects are sometimes caused during this period of the burning by the deposition on the ware of tarry distillation products which have boiling points higher than that of water and are precipitated on the warm porcelain. These compounds, being in a fluid condition, may be absorbed by the porous ware. By the continuation of the burning these deposited materials volatilize, the expulsion being assisted by the contraction of the pore spaces of the ware. If the temperature is increased too rapidly the tar is not completely expelled and may give trouble later on in the burning, causing a dark-colored deposit in the finished porcelain. Often these deposits cause perceptible blow holes or pockets in the finished ware.

It is, therefore, advisable to work with more or less excess of air during this period of the glost burn.

THE REDUCTION PERIOD

During the reduction period the chemical composition of the gases of combustion is of particular importance. In addition to heating up the kiln and ware the gases have chemical work to perform. Thruout this period the gases must be reducing in character. Practical experience has proven that a content of five per cent. of hydrogen and carbon monoxide is not excessive. In order that the pores of the ware may not contract too rapidly it is important that the kiln temperature be not permitted to rise too quickly, so that the necessary reduction of the body and the glaze be not terminated before completion. During the reduction process the ferric oxide contained in the body and in the glaze, either in the free or combined state, is reduced to the ferrous oxide, which combines with the silica of the body and of the glaze to form ferrous silicate. The yellow color of hard procelain and of whiteware not colored by a cobalt stain when burned in an oxidizing atmosphere, for the most part, is due to the presence of ferric silicate. The effect of the ferrous silicate upon the color of the body and the glaze is much less noticeable than the presence of ferric silicate, the yellow tinge disappearing almost completely. This is explained by the black color of ferrous silicate, and the consequent gray-white color produced. However, the reduction process is beneficial to the color of the body and of the glaze only when the ferric oxide is present in a finely disseminated form. Iron which has been converted to ferric hydroxide during the process of preparation of the body may, by the reduction process, be converted to metallic iron whose presence in the body or glaze is noticeable. Bodies containing iron in this form should be lightly oxidized toward the finish of the burn, in order to convert the metallic iron to the ferrous condition.

The reducing process renders the presence of larger particles of iron in the body or glaze much more objectionable, the reduction causing slagging of the iron and consequently larger spots. For this reason especial attention should be given to the elimination of particles of iron from the body and the glaze during their preparation for the manufacture of hard porcelain. As far as possible the body should be kept free from contact with metallic surfaces during preparation and should be carefully lawned and magneted. The rewashing of the kaolin by deflocculation with an electrolyte decantation and subsequent flocculation appears, in some cases, to render the body markedly free from iron specks visible to the naked eye and detrimental to the appearance of the ware.

The biscuited ware contains salts of the alkalies and alkaline earths derived from the raw materials. These salts are contained principally by the ball clays. Also the salts may be introduced from contamination by the plaster molds used in forming the pieces. By the employment of the reducing gases these salts are decomposed at a bright red heat. This decomposition can only occur in the ware as long as it remains porous, so that the diffusion of the reducing gases thru the pores can take place. If the pores of the ware and of the glaze become closed to the entrance of the reducing gases caused by a sintering of the glaze and contraction of the constituents of the body, the gases from the decomposed salts cannot escape and cause defective ware by becoming enclosed, forming cavities or blebs in the body and glaze. These salts may be finely disseminated thru the body or may be present in the form of crystals which have formed during the drying treatment. In the latter case, defects due to too rapid heating are specially noticeable.

In burning large pieces of porcelain sufficient time must be allowed for the diffusion process. The soot suspended in the combustion gases takes small part in the reduction process on account of its solid form and consequent inability to penetrate the pores of the ware. However, it is better to avoid smoke in the gases of combustion as far as possible. Carbon monoxide and hydrogen, on account of their lower specific gravity, diffuse quickly and are to be preferred to the heavier gases.

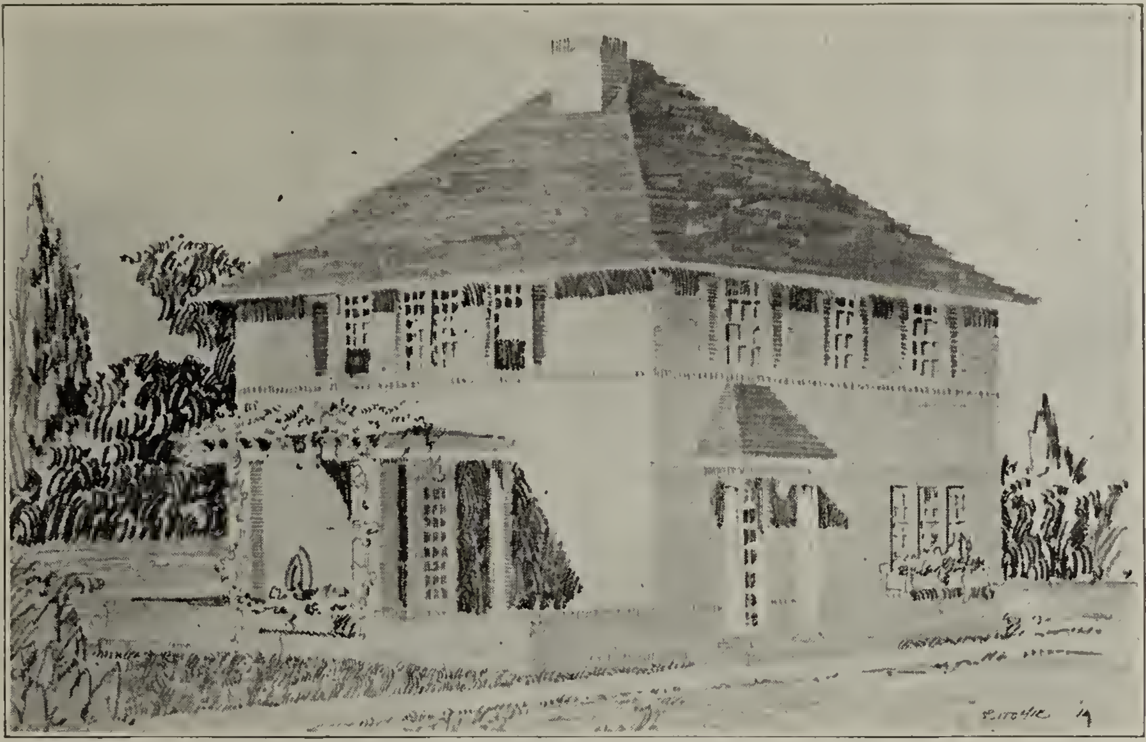
At this point it is emphasized that imperfect firing during the biscuit burn is apt to cause trouble during the reducing period of the glost burn. This is especially

(*Continued on page* 865.)

The Brick House Shown in the Accompanying Illustration was Designed by Mr. Ritchie—a Cleveland Architect—for the Benefit of the Prospective Builder Who Has But a Comparatively Small Sum to Invest.

Any Contractor in the "Sixth City" Guarantees to Build it for $3,450 Complete.

The House Contains Six Rooms and is Modern in Every Respect.



"*A* BARGAIN *in* HOMES"

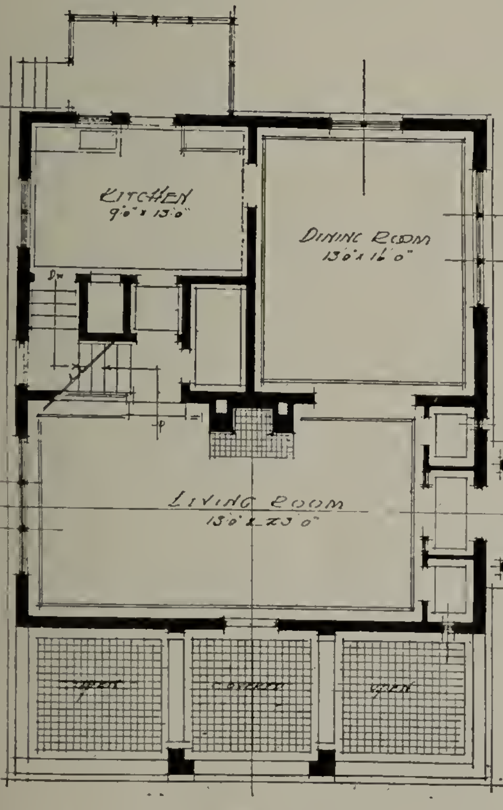
Wherein is Adopted a Familiar Real Estate Sign to Indicate the Real Value in Brick Homes for Little Money

By George W. Ritchie

in a Paper Read Before the American Face Brick Association

I NOTICED that your Chairman, when he introduced me, referred to me as a convert to the use of brick. If it is possible for a person to be both in error and correct, then that is the position in which your Chairman finds himself.

He is in error, inasmuch as I have always admired brick, and studied its wonderful possibilities, and for that reason it gives me great pleasure to be allowed this opportunity of addressing a body of men who are engaged in the manufacture and sale of the finest building material made—brick.



First Floor Plan of the Building Shown Above

There is nothing more flexible, more brilliant with color, and so adaptable as brick. We need only to study the work of the old art-loving nation of Italy, and we find that they do, not only their small domestic, but monumental building, of brick. Normandy has shown us the uses to which brick can be put with indescribable charm.

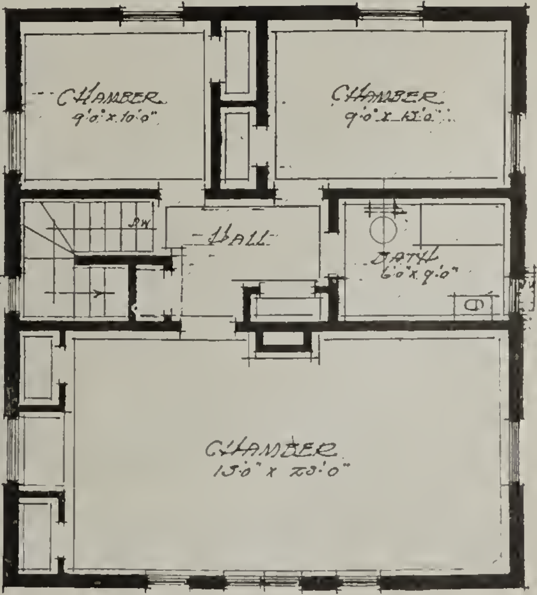
There is nothing more beautiful, more sparkling, nor more practical, than a plain brick wall. It does not need the assistance of other materials to give it life. It has the charm of a piece of jewelry, the brightness and sparkle of the sunshine, the gleam of a diamond, and one thing that the most cynical must admit, and that is life everlasting.

I must confess that I am a convert, but only in the use, adaptability, and practicability of brick as a medium for the use of the man of small means in the erection of his modest home.

Less than a year ago, I was a member of that class of architects who, if a client comes into their offices and says that he has three thousand dollars and wants a house of six rooms designed and of brick, would tell him it is impossible.

I would have led such a client to a chair, talked earnestly to him, and told him that if he would go out and get about four thousand dollars more and return to my office, I would do business with him.

Thru the efforts of Ralph P. Stoddard of Cleveland, Ohio, I found that this client with his three thousand



Second Floor Plan

dollars had felt instinctively something that I had to learn. He was correct. You can build a small, modest house of brick, and for three thousand dollars.

To prove that statement, I have brought with me plans and estimates—not "doctored" and padded, to look well, but estimates from contractors in Cleveland who are ready and willing to do this work at the price given.

These plans are the result of investigation of conditions existing in the city of Cleveland, but these conditions are typical of every large city in this country today.

I put myself in the position of the man who had saved a little money and had a desire to provide his family with a better home. We decided that we wanted a small brick house of four or five rooms, and settled upon a location that we liked.

We started out and covered the entire neighborhood, but to our dismay, we were unable to find a single brick house that was either for rent or for sale. We saw a few brick homes, but we knew that they were out of our reach, even if they had been on the market, as I had only $3,200 for our house.

We repeated our little trip into several districts, and I must say that we even went down the scale as to the neighborhood, but with the same result. We were unable to buy or rent a single brick house of that size or price.

On one of our trips we met Mr. Carpenter Builder when we priced a frame house, but even that cost more money than we had. I told him that I was looking for a brick house for $3,200, and he laughed—said it was impossible to buy or build a brick house for that sum.

After talking for what seemed hours, he convinced us that we were wrong and that he was right. He took us about the city in a large touring car and showed us a great many of what he called "beautiful homes." We did not see a thing that we would buy. Did he give us up? No, indeed. Instead he took a better grip, and said, "You tell me what you want. I will make the plans and build the house."

He sold his house then and there. The plans that he showed us looked very well, and we decided upon them.

The house was finished and was added to the row, already miles long, of practically the same thing. And mine was only one case in a million thruout this country today.

A Two-Family House of Brick That Can Be Erected at a Cost of About $4,750

To my mind the man that the brickmaker has to fight is this same carpenter-builder. You cannot afford to take a punch at him in the back, but you must punch, and continue to do so, making each punch harder than before until you have him on his knees, begging for mercy, and pleading with you to lay off.

Being a lover of brick and its possibilities, and a firm believer in the housing of the workman and the middle class in safe and sane houses, you can very readily see that I fell a victim to Mr. Stoddard's arguments, and became a convert, and a fighter for the use of brick.

I notice that the subject of my talk on the program is shorter than the one I have chosen, namely, "The Advisability and Practicability of a Brick House from the Purchaser's Standpoint."

That is a long title, I admit,—but, gentlmen, to my mind, that is the gateway to an immense field, one that should be entered, and driven from it what I am pleased to call Mr. Builder. This man does not even build a wind-resisting, let alone fire-resisting house. He will start at seven o'clock on Monday morning to dig a hole, and it almost seems that on the following Monday, at the same hour, the vans appear and the family moves in.

The advisability of the brick house for the middle class is far-reaching and, in itself, a subject for a lecture. But the buyer must be shown that the brick house is within his reach.

We find very fine examples of this kind of dwelling in Europe. At Bournville, a suburb of Birmingham, England, is one of the newest and finest examples of this type of housing.

This village was laid out and developed by the principal owners of a large factory that had previously located in the village. The houses are all of brick, or stucco on hollow-tile, with slate or tile roofs. They are sold on a ninety-nine year lease, for an average of $2,600 to $3,200 for three, four, and, in some cases, five rooms. They are laid out in single houses and four-family houses, each fourth of the last mentioned type being owned by an individual.

We find another good example of permanent home building at Port Sunlight, Cheshire, England. This is along the lines of Bournville, but is much older.

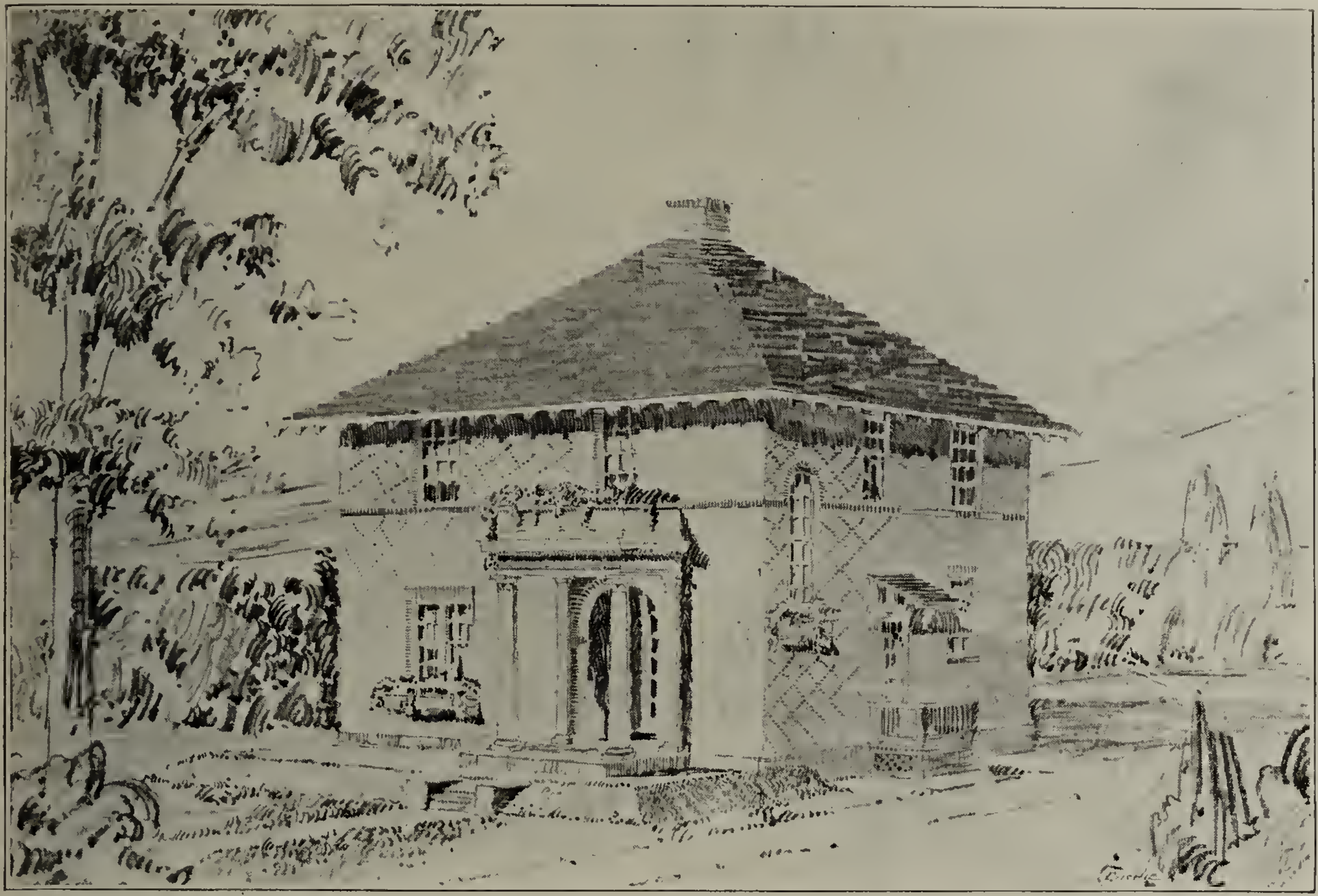
What I consider one of the finest and most unselfish in thought given for the mutual benefit of both employer and employe, is Woodland Mining Camp. This entire village, with broad shaded streets, schools, stores, and even a railroad station, was laid out for the sole comfort of the miners working in the South Yorkshire coal fields. It is arranged in groups of two, three and four-family houses under one roof, which rent for five dollars a month, with a five-dollar annual land tax.

Germany has a very excellent example of this type of housing at Essen, where the principal plant of the Krupp Iron Works is located. These are copied somewhat after the English models, and are fire-resistant thruout. They were built at a cost varying from $845 to $1,750 a family.

It is needless to state that the atmosphere of these villages is one of durability, practicability, and good sanitary conditions.

To get to this side of the water, we find one small development in Toronto, Canada. This is a case of two and four-family houses that rent for about twenty-five dollars a month for four rooms.

We have another example at Reading, Pa., where single and double brick houses were built at a cost ranging from $2,900 up to



Thirty-two Hundred Dollars Is All That Is Necessary to Make the Man of Moderate Means the Proud Possessor of This Beautiful Brick Home

$3,500, for five and six room houses. So you see we have plenty good examples of the advisability of the brick house.

The practicability of a brick house is the hardest thing for the average buyer to understand. If an architect starts talking brick to the client with even as much as $5,000 to spend, invariably the prospective client, to use a slang phrase, will say "nobody home."

It then becomes the painful duty of the architect to explain to this person that, when the house is finished, he has a wind-proof, fire-resisting, durable and practically ever-lasting house, one that is more easily heated in winter, much cooler in summer, when compared with frame, and a house that is without bills for maintenance.

The average client does not stop to think that, before the house is a year old, if of frame, the exterior will need repainting, and, in many cases, repairing of defective woodwork. Nor does this man think of the chance of his house being caught in the rush of flames that might start in his neighborhood.

I have visited sections of Cleveland and other large cities, where street after street is built up entirely of frame houses costing from $3,500 up to twice that sum, packed close together, and I could not resist the temptation to exclaim, "If a blaze should start, what a bonfire that would make."

If the homes on that street were built of brick, such a fire would be impossible.

As I have said before, your biggest fight is against the carpenter-builder, who makes plans, builds the house, and does not care to know what a brick house costs.

You must educate the people, the brick salesman, and in some cases, I regret to say, the architect. The people must be shown that they can build of brick at no greater cost than frame; the salesman educated up to the point that he literally eats, drinks and sleeps brick; the architect to where he will talk brick and not frame to a client who has less than six or eight thousand dollars to invest.

Upon the request of the Ohio face-brick manufacturers, I have made a study of these possibilities, and have prepared plans. In each case I have taken the general type of house that is being built in frame for speculation in the city of Cleveland and had them estimated in brick with the following results:

House No. 1

Six rooms and bath, size 26x26, cost $3,800

House No. 2

Six rooms and bath, size 25x22, cost............$3,400

House No. 3

Five rooms and bath, size 21x24½, cost..$3,200

House No. 4

Sevent rooms and bath, size 18x33, cost......$3,726

**House No. 6—
Double House**

Each suite, five rooms and bath, size 29x40 ft. 6 in., cost............$4,750

These estimates are bona fide, and the contractor guarantees to build the houses in Cleveland or vicinity for the sums above stated. Local conditions at other points would naturally affect these prices, but they should not vary more than one hundred dollars up or down for all of the houses enumerated above.

These plans and estimates are conclusive proof that a small brick house costing three thousand dollars is not a dream but a reality. The houses here shown are planned with a fire-resisting roof and are ready for occupancy, even to the interior decoration and the outside grading.

I was instructed to have them estimated to use a face-brick costing sixteen dollars a thousand. If I may be permitted to say it, I feel that this is a mistake. There are schools in the city of Cleveland costing from $100,000 to $200,000 that were built with a brick costing as low as fifteen dollars a thousand.

Naturally, I am not in a position to tell you how you are going to do this or that you should do it. But I am convinced that there would be more brick houses built if the man of small means knew he could secure brick at less cost than the rich man's home or the monumental building.

Along that line of thought, I wish to say that one of the largest schools in Cleveland was built of not even a face-brick, but a good common-brick. I was ridiculed at the time I planned that structure, but the district was one where ninety per cent. of the population could not speak English. That building is talked about more than some of the buildings where the brick cost twice as much.

The people of that district take a great pride in the building and make it a show point. I state that, gentlemen, merely to show that even those poor people, living in shacks, appreciate the brick.

What is now the largest market for brick in this country can be made larger if the manufacturers and the sellers of that material will band themselves together with but one thought, and that is *make brick predominate*. This can be done, and you can do it by working together for mutual benefit. Make more brick, sell more brick, and get the builders to use more brick.

I think there is a prominent place in the Hall of Fame waiting for the man, or body of men, who are going to make brick for the small house predominate over frame in these United States, and I think that the oldest member present will witness the day when this is accomplished.

WHY WORRY *about a* MARKET?

Three Quarters of a Million Garages on America's Farms Offer a Rich, Almost Undeveloped Field to the Hollow Tile Manufacturer in Low Cost, Fireproof Shelters for the Car

A Neat-looking Hollow Tile Garage on a Farm in Cerro Gordo County, Ia., That Can Be Duplicated for a Comparatively Small Sum.

IT IS CONSERVATIVELY ESTIMATED that there are not less than seven hundred and fifty thousand automobiles in use on the farms of the United States. When it is remembered that there are approximately seven million farms in this vast republic, and figuring that one out of every tĕn farmers owns a car, it will readily be seen that the above estimate is not at all an exaggeration.

The fact that a farmer possesses an automobile also means that he requires a place to store the car when it is not being used. If every farmer had a garage, then three-quarters of a million of these structures would dot the countryside. Proceeding farther in our imagination, it is not hard to picture this huge array of buildings as being constructed of brick or hollow-tile. With these thoughts in mind, some conception may be had of the importance of this type of building as an outlet for the manufacturer of burned clay materials.

Unfortunately, thousands of farmers and stockmen prefer to take long chances in housing their cars along with their cattle or other valuable property in a barn, to avoid the necessity of building a garage. Others are ignorant or simply careless in this respect, but no matter what motive may inspire the farmer to invite a fire by placing an automobile in a wooden structure, a big opportunity in the form of a rich market lies before the clay products manufacturer who will show the "country gentleman" the risk he is taking and demonstrate to him that a fire-safe, permanent, damp-proof and low-cost-of-upkeep garage can be built of burned clay materials for a small initial cost.

While safety from fire is a good and sufficient reason for building a garage, it is not the only one. Owing to the value of this piece of machinery with its many intricate parts, a suitable and adequate protection should be provided—something more than a corner in the stable, where there is often much dampness in the air to rust the metal parts or disintegrate the tires, and litter to be tracked into the car or be thrown against the sides in passing. These sides, by the way, are covered with a delicate coat of enamel, which rough handling soon mars and disfigures. This last mentioned advantage of a garage—that of protection—should be particularly emphasized to the farmer, where the leaving of the car out in the open overnight or for several days, has become a habit.

One Hundred and Fifty Dollars Was the Approximate Cost of This Fire and Damp-proof Garage of Hollow Tile.

While the lack of time or money, or both, have been offered as excuses for not building a garage, it is more often a failure to realize the seriousness of exposing his property to fire or the unnecessary waste resulting from housing the car in poor quarters, or none at all, that is the real reason for most farmers not having a garage. However, where insufficient time seems to be the obstacle, it might be well for the farmer to stop and consider if the building of a garage is not more important than some of the tasks that are now taking up most of his time. In most cases it will be found that this is true.

Disproving the belief that a large sum of money is required to provide a shelter for the car, the garage shown in the larger of the accompanying illustrations is offered as a solution to the problem, its cost being $152.13.

This building is twelve feet wide, twenty feet long and eight feet high to the eaves. Hollow clay building tile, eight inches in thickness, were laid upon a foundation composed of conduit "seconds," for the base wall. On top of these were laid six-inch hollow-tile to the eaves, these last mentioned tile being covered with white stucco on the exterior surface. The roof is three feet high at the ridge, being constructed with a wooden frame, which is covered with fireproof shingles. On the inside of the building the walls and ceiling are plastered. This, however, may be omitted and the cost of the building lowered. The floor is of cement. Two single sash windows and a double end door complete the equipment of this remarkably attractive and well-built garage.

In order that anyone who is contemplating the erection of a garage may have the opportunity of figuring on a fireproof, and permanent building, the itemized figures, showing the actual cost of this garage are given in the accompanying table.

With regard to the conduit "seconds" that were used in the foundation and floor of this building, it might be said that these are not obtainable only in certain sections, and for this reason, it is suggested that first quality, vitrified hollow-tile be substituted. While this might raise the cost slightly, if the plastering is omitted, the building can probably be erected for approximately $150.

It will be noted that hollow-tile—or conduits, as it happens to be in this case—were laid for the floor with a topping of cement, perhaps one or two inches in thickness, spread over them. This form of construction makes a dry floor, due to the insulating air spaces in the tile—an advantage not to be underestimated when it is remembered that rubber tires have to rest on this floor many hours every day and sometimes for days at a time. Disintegration of the tires and rust of the machinery is thus obviated. The lack of this feature is a great objection in floors of solid masonry, which, it is claimed, draw dampness from the earth beneath. There is no denying the fact that a solid floor is colder, and, therefore, more liable to condense moisture upon its surface than one that is provided with insulating air cells, thru which neither moisture nor heat will readily travel.

A hollow-tile farm garage in Cerro Gordo county, Iowa, is also shown herewith, this building being different in size, design and finish than the one first described. Hollow clay building tile 5x8x12 inches were employed in its construction, no stucco being used. The roof consists of a wooden frame, with a fireproof composition roofing paper laid over it and cemented. The cost of this building was not obtained, but it is estimated at about $125, and surely not more than $150. Both of the garages here shown are built to accommodate one car.

MASONRY:			
Walls:			
368 6x12x12 hollow tile, @ 6½c each		$23.92	
160 8x 8x16 hollow tile, @ 7½c each		12.00	
20 6-duct, 3-foot conduit sections, @ 15c each		3.00	
20 4-duct, 3-foot conduit sections, @ 10c each		2.00	
3¼ bbls. cement, @ $1.50		4.90	
1 bbl. lime		1.00	
2 yards sand, @ 75c		1.50	
2 bags of plaster, @ 30c		.60	
500 lath, @ $2.50 per M		1.25	$50.17
Floor:			
2½ bbls. cement, @ $1.50		$ 3.75	
1¼ yards sand, @ 75c		.94	
¾ yard gravel, @ 75c		.57	
120 3-duct, 2-foot conduit seconds, @ 3c		3.60	$8.86
ROOF:			
22 pieces 2x4x10-foot lumber,	147 feet		
14 pieces 2x4x12-foot lumber,	112 feet		
20 pieces 1x4x10-foot lumber,	67 feet		
	326 feet, @ $15.00	$ 4.89	
1x10-foot sheeting	210 feet		
1x 8-foot sheeting	130 feet		
8-foot shiplap	56 feet		
	396 feet, @ $25.00	9.90	
10 pounds nails, @ 2¼c		.22	
4 squares asphalt shingles, @ $3.85		15.40	30.41
DOORS AND WINDOWS:			
Door (Double):			
3-inch flooring	48 feet		
2x6x16-foot pine	56 feet		
	104 feet, @ $25.00	$ 2.60	
Door Frame:			
2x8 pine	43 feet, @ $24.00	1.07	
Window Frame:			
2 2x8 frames, @ $1.00		2.00	
2 sash, @ 50c		1.00	6.67
Total cost of material			$96.11
LABOR:			
Walls:			
59½ hours mason, @ 30c		$17.85	
55½ hours helper, @ 17½c		9.72	
Floor:			
7 hours mason, @ 30c		2.10	
20 hours helper, @ 17½c		3.50	
Roof:			
39 hours carpenter, @ 21c		8.19	
22 hours helper, @ 17½c		3.85	
Doors:			
30 hours carpenter, @ 25c		8.50	
11 hours painter, @ 21c		2.31	$56.02
Total cost of building			$152.13

Government Preparing Brick Roads Bulletin

A bulletin on "Brick Roads" is in course of preparation by the Division of Roads, Agricultural Department, Washington, D. C., which will doubtless be of great interest to paving-brick manufacturers. The bulletin will contain a comprehensive review of brick roads all over the country, cost of construction, cost of maintenance, method of construction, and other important topics relative to brick roads. Another bulletin is being prepared by the same department relative to road mileage thruout the country. This is a bulletin prepared every five years. In addition to other information it will, of course, contain the number of miles of brick roads.

Sharing Profits with Employes

The results of an extensive investigation and analysis of more than two hundred profit-sharing plans in the United States have just been made public, says the "Mining and Engineering World." The work was undertaken as a result of the widespread interest taken by employers in efforts to establish plans for sharing with employes earnings in addition to fixed regular wages. It was found that many of the experiments had been abandoned as acknowledged failures; others are still in existence, with varying degrees of success, and differ widely in their methods. The views of many labor leaders were obtained and are unanimous in opposition to the general theory of profit sharing, as they claim that the employers' real interest in such plans lies in their alleged usefulness as a means to weaken and disrupt the trade unions. In other words, the trade union has been and is resolutely for the payment of wages according to a certain fixed rule of so much per hour or day per man, no matter whether his work is better than that of another man or not.

About one-third of the companies whose plans have been analyzed by the Federation report that they consider profit sharing a success. Others presumably hold the same view, as they continue the experiment from year to year. Among reasons given by employers for their faith in the idea are that it promises more continuous service, reduces cost of production, secures more regular attendance at work, builds up confidence and creates a spirit of co-operation, gets rid of rolling stones and encourages home building, promotes efficiency, interest and loyalty and increases the profits of the business. Surely with such results obtained by many companies, further investigation of profit sharing will be worth while and the publication of the full report of the Federation, which, it is announced, will be in book form, will be awaited with interest by many who are interested in this important subject.

AMONG *the* POTTERIES

It has just developed that the idle plant in East Liverpool, Ohio, which is owned by the Electric Porcelain Company, is not to be operated by an automobile accessory manufacturing concern, but is to be used by a new electric porcelain company. The property was turned over to the Parkersburg (W. Va.) electric porcelain combination when all of the East Liverpool plants entered the merger. It was agreed then that none of the properties at the last-mentioned point should be sold to parties who would enter into competition with the Parkersburg business. To overcome this, a Detroit automobile concern is alleged to have taken over the plant, and in turn, transferred it to Harry Peach and George Reed, of East Liverpool, and the latter are now preparing to start the plant not later than June 1. The Electric Porcelain Company, of which George O. Anderson is secretary, will meet in East Liverpool on May 8 to dissolve the corporation. It is reported that a new company will then be formed, and that Mr. Anderson will be identified with the new concern. He is now associated with the offices of the Parkersburg company.

The fact that the idle pottery at Grafton, W. Va., formerly operated by the Consolidated Manufacturers' Company, was not sold by the courts on April 22, as announced was a surprise to many. Thomas Price, formerly of the American China Company, Toronto, Ohio, and who was interested in the Grafton plant, was one of the bidders at the sale, and it is believed by some that he was acting for those interests who were in the minority when the pottery was started. D. E. McNicol, president of the D. E. McNicol Pottery Company of East Liverpool, Ohio, and of the McNicol China Company, of Clarksburg, W. Va., was also a bidder. The bids were run up to about $52,000, and then it was announced that the sale was postponed. There is reason for believing that the property will be sold eventually and placed in full operation.

Final arrangements have just been completed whereby the Cartwright Brothers Pottery Company of East Liverpool, Ohio, will take over and operate the plant of the East Liverpool Sagger Company, which was formed some years ago by George Croxal, formerly owner and manager of the Croxall Yellow Ware Pottery Company, and Alex McBane, well-known engineer. The plant will be known as the Cartwright Pottery Company No. 2, and saggers will be made exclusively. A patented sagger machine has been installed, and instead of making dozens of saggers a day, the machine will turn them out by the hundreds. The plant is to be placed in immediate operation, and it is probable that several new kilns will be built.

According to reports, a new company is about to be formed at Pittsburgh, Pa., for the manufacture of a line of sanitary pottery by the casting process. Little is known about the plans of those said to be back of the movement, other than patents have been applied for on some of the new items, and that, to manufacture such merchandise by the casting process, would greatly reduce the cost under the present method of pressing by hand. It is also said that a new plant is to be built in the eastern Ohio district where the new line will be made.

The Louthan Supply Company of East Liverpool, Ohio, has bought one of the idle electric porcelain plants at that point, which was formerly operated under the name of the Anderson Electric Porcelain Company. The company will operate its present and acquired property in the manufacture of pins, stilts and other supplies for pottery manufacturers, and also ceramic attachments for gas mantles. The business of this company has increased so fast during the past year that additional capacity was necessary.

Manufacturers of vitreous hotel and china dinnerware in this country are crowded with business, and it is known that some manufacturers have from time to time asked each other to help them out by selling them staple white goods. The kiln capacity of this trade has been increased during the past season, but still new business is being received in such volume that shipments are greatly delayed in leaving the plants.

The demand for flower pots has been excellent all spring, according to the Louisville (Ky.) Pottery Company, which reports that it is working to full capacity in that department. The florists have had an excellent spring season and are placing large orders for pots. Stoneware crocks, jugs, and so forth, are showing some improvement, but are not as active as they should be at this time of year.

A casting department has been installed at the plant of the Cartwright Brothers' Pottery, East Liverpool, Ohio, and was placed in full operation for the first time during the past week. Since this company was placed under the management of C. L. Gray, it has increased its kiln capacity and has made a number of additions to its lines.

Charles C. Ashbaugh, general manager of the West End Pottery Company, East Liverpool, Ohio, has been elected president of the recently organized chamber of commerce of that city. A campaign for new industries has been launched as a result of the efforts of this well known pottery manufacturer.

The Hampshire Pottery of Keene, N. H., which was owned and operated for forty-three years by James S. Taft, has been sold to George N. Morton of Boston, Mass., who will continue its operation. The plant consists of a main pottery building, kiln sheds, engine and boiler house and a large storage building.

Pottery manufacturers are starting to arrange for new dinner shapes to be placed before the trade next January. Two new shapes have so far been ordered from modelers, and other specifications are expected within the next two months.

The EFFECT *of* SALTS *on the drying behavior of* SOME CLAYS

How Sodium Chloride Aids the Drying and Burning of Certain Iowa and South Dakota Clays — A Result Not Possible with All Raw Materials

By Homer F. Staley, A. B.

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SEVERAL ARTICLES have been published during the last few years dealing with the effect of salts on the volume shrinkage during drying of clays made up in the plastic state. Among these may be mentioned the publications by Bleininger[1], Bleininger and Fulton[2], Kerr and Fulton[3], and Black[4]. Incidental to their treatment of other problems, several investigators have noted that the addition of common salt, NaCl, reduced the cracking of certain clays during drying. In fact, the use of salt for this purpose is not at all new. One manufacturer, at least, in Iowa has been employing it for many years with excellent results. Inasmuch as many clays in Iowa are difficult to dry, and the data cited show that small amounts of salts have a decided effect on the drying behavior, it seemed desirable to make a study of the subject in relation to Iowa clays.

While the work that had been done on volume shrinkage was of considerable interest, the results obtained did not seem to account for the remarkable effect of salts in reducing cracking. It was, therefore, decided to attack the problem mainly from the standpoint of the effect of salts on the rate of drying. Arrangements were also made for determining linear shrinkage, the amount of cracking and the stage of the drying at which it occurs.

EXPERIMENTAL WORK

Procedure. In making up a series of samples, the salts were dissolved in or mixed into the tempering water. The clays were then thoroly tempered by hand and made into half brick 4½ in. by 4½ in. by 2¼ in. in size. This size gives a drying effect similar to that of whole brick. The first samples made in a series were put into a wet closet until the last ones were finished, and the completed series was kept in the closet for several hours. The whole series was then allowed to start drying under predetermined conditions. While these conditions, no doubt, varied somewhat during the drying period, all the samples in a series were exposed equally to the effect of the variation. The results for any one series, therefore, show the effect of various amounts of different

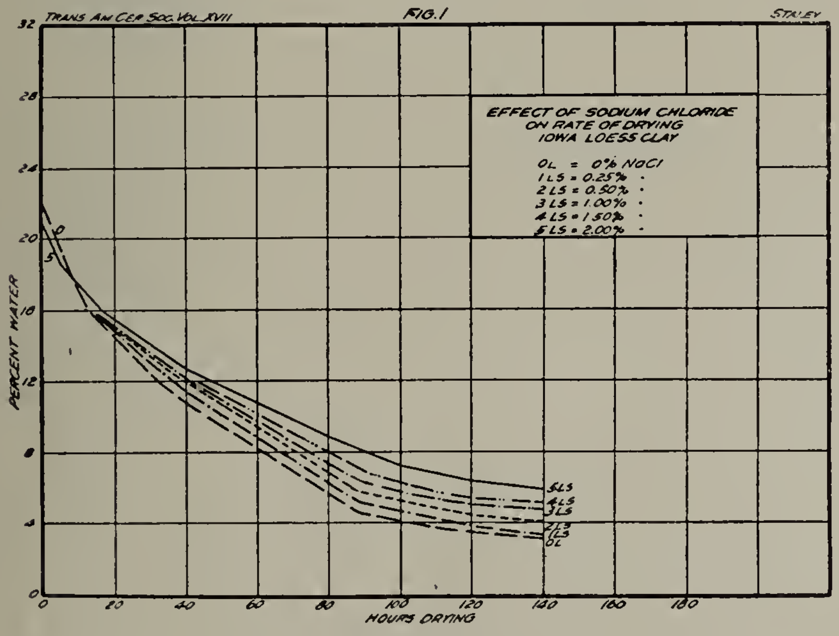

Fig. 1

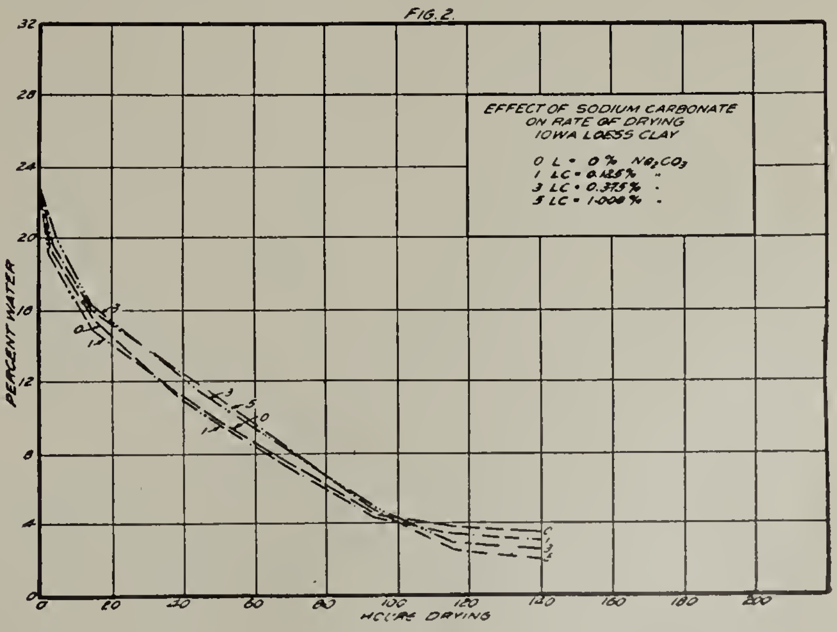

Fig. 2

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[1] Orig. Com. 8th Intern. Congress Appl. Chem., V, 17-32.

[2] Trans. Amer. Cer. Soc., XIV, 827, 839.

[3] Trans. Amer. Cer. Soc., XV, 184-192.

[4] Trans. Amer. Cer. Soc., XVI, 515-546.

[5] Keele, Trans. Amer. Cer. Soc., XIV, 154.
Bleininger, Orig. Com. 8th Intern. Congress Appl. Chem., V, 24.
Rainey, Trans. Amer. Cer. Soc., XVI, 406.

salts on samples of clay made up and dried under the same conditions.

The points noted in drying behavior were: rate of loss of water, amount of cracking, and, as far as possible, linear shrinkage. No attempt was made to determine volume shrinkage, first, because it was feared that the immersion of the wet samples in oil, which is necessary in volume shrinkage determinations, would have some effect on drying behavior, and second, because such measurements cannot be made on clays that crack badly in drying. In fact, on account of the prevalence of cracking in our samples and the inherent crudeness of linear shrinkage methods, we do not claim a high degree of accuracy for the individual shrinkage measurements.

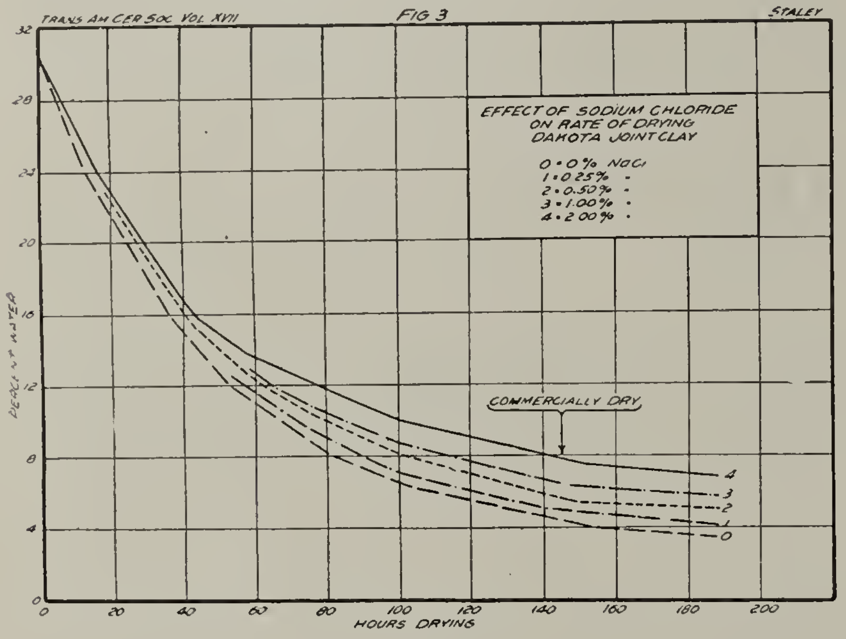

Fig. 3

IOWA LOESS CLAY

In the northern part of the Mississippi Valley, west of that river, occur vast areas of loess clays. Two-thirds of the state of Iowa is covered with these clays. They are supposed to be wind blown deposits. They are really mixtures of limey red-burning clay with large proportions of fine grained sand. The leanest ones are clayey sands, similar to molding sand, and those richest in clay would be classified as very sandy clays.

In many localities, these loess clays are the only ones available even for the manufacture of common-brick and drain-tile. Owing to the large amount of sand they contain, they are not plastic enough to make large size tile, but for the manufacture of common-brick and small drain-tile, they have several advantages. They are soft and unconsolidated. Therefore, they are easy to dig and require no grinding. As a rule, they vitrify gradually and are, therefore, easily handled in burning. Formerly, these clays were worked in hundreds of small yards, but these plants are rapidly ceasing to operate on account of the great difficulty of drying the clays without cracking. The less sandy clays work the best both in manufacture and drying. Since the tenderness of the clays is due to lack of sufficient plastic bonding material, preheating treatment simply aggravates the trouble. Any economical method of rendering these clays safer to dry is a decided advantage.

In Table 1 are shown the data for the effect of sodium chloride (common salt) on the drying behavior of a typical loess clay. The rate of drying is shown graphically in Fig. 1. It will be noted that the addition of salt decreased the rate of drying, increased the amount of hygrosopic water in the clay, increased the shrinkage, and decreased the cracking. We have obtained similar results with several loess clays dried under various conditions. In all cases, the cracks appear during the first four or five hours of drying, grew wider for a time, but about the time shrinkage ceased, tended to close up.

In Table II, are shown the data for the effect of sodium carbonate (soda ash) on the same clay. Fig. 2 shows the rate of drying in curve form. These samples are made up and dried along with those containing sodium chloride. The first small addition of sodium carbonate increased the rate of drying at all times, but larger additions decreased it slightly during the bulk of the drying period and increased it very slightly at the end. Sodium carbonate decreased hygrosopic water, reduced shrinkage and increased cracking. The cracks all appeared in the first few hours of the drying.

DAKOTA JOINT CLAY

In many parts of the northern Mississippi Valley so-called "joint" clays are found. These are sticky plastic clays that warp badly in drying and tend to crack into cube-like forms. These clays are found in several parts of Iowa, but one from South Dakota was chosen for experiment because it had failed to respond to preheating, the usual method of treatment.

In Table III and Fig. 3, are shown the effects of sodium chloride on this joint clay. The results are similar to those obtained with loess, the only difference being that little effect on shrinkage was noticeable. In Table IV and Fig. 4 are shown data for sodium carbonate. In this case, the first small addition of the salt increased the drying rate thruout, and larger additions decreased it. Small additions decreased hygroscopic water, but larger ones increased it. Sodium carbonate had small effect on shrinkage, but had a strong tendency to produce cracks. These all appeared during the first few hours of the drying.

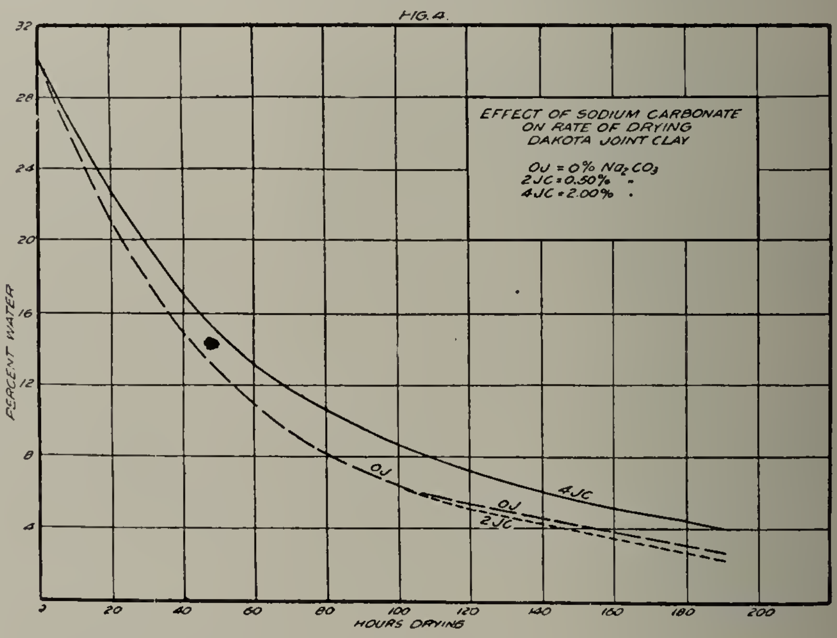

Fig. 4

WOODWARD SHALE

The effects of the soluble salts commonly found in clays have considerable interest. In connection with some other work, we found it necessary to add calcium and magnesium sulphates to a red burning shale from near Woodward, Iowa. In Table V and Fig. 5, are shown the results for magnesium sulphate. It will be noted that magnesium sulphate decreased the rate of drying and increased the amount of hygroscopic water. There was no noticeable effect on shrinkage and no cracking in any of the samples. Unfortunately, this clay proved to be naturally safe drying, and so not well adapted to demonstrating the effect of the salts on cracking. However, we found in another series of experiments that magnesium sulphate did decrease cracking of tender clays.

In Table VI and Fig. 6, are shown the results for calcium sulphate with the same clay. The first addition reduced the rate of drying at all stages. Larger additions increased the rate of drying very decidedly in the early stages and decreased it slightly at late stages. The calcium sulphate increased hygroscopic water. The shrinkage was reduced, and no cracking occurred. It is believed that the chemical action of calcium sulphate is similar to that of magnesium sulphate and is really exemplified by the effect of the first small additions. The peculiar effect of larger additions of calcium sulphate in hastening the drying is thought to be due to the crystallization of the bulk of the calcium sulphate as soon as the water began to be evaporated from the clay. It will be remembered that calcium sulphate is sparingly soluble. The growth of calcium sulphate crystals would tend to open up the clay and allow drying to take place more rapidly.

EFFECT ON COLOR

While both common salt and soda ash increased the amount of scum formed in drying, they caused no scum on the burned ware. In fact, in one case a clay, that showed considerable scum on the burned trials when no salts were used, showed progressively decreasing amount of scum on the burned ware as the amount of either sodium chloride or soda ash was increased. Evidently, the heavy scums formed by sodium chloride and soda ash in drying had served to volatilize or flux into the body the normal non-volatile and infusible scum. In general, the only effect of soda ash was a slight darkening of the color of the ware. On the other hand, sodium chloride produced clearer and brighter colors. This is no doubt due to volatilization of iron chloride.

Rather to our surprise, addition of calcium sulphate in amounts up to three per cent to a clay free from soluble salts did not cause scumming. This is probably due to the comparatively small solubility of calcium sulphate in water (approximately 1 part in 500 of water) and the marked hastening of the drying caused by this salt. Magnesium sulphate and mixtures of magnesium sulphate with calcium sulphate produced copious scumming.

EFFECT ON VITRIFICATION

The effect of salt additions on vitrification was appreciable in the cases of sodium carbonate and sodium chloride. The first was to be expected; but owing to its volatile nature, the fluxing action of a small amount of salt was a matter of conjecture. We had an opportunity to determine the fluxing effect of a small addition of salt in three clays. The effects on absorption are shown in table VII and Fig. 7, and those for fire shrinkage are shown in table VIII and Fig. 8. Clay A was a typical loose clay. Clay B was made up of a mixture of 80 per cent. of Clay A and 20 per cent. of a fine grained shale. Clay C contained 60 per cent. of Clay A and 40 per cent. of the shale.

From a study of the data, it is seen that the addition of one-half of one per cent. of common salt had the following rather remarkable combination of effects.

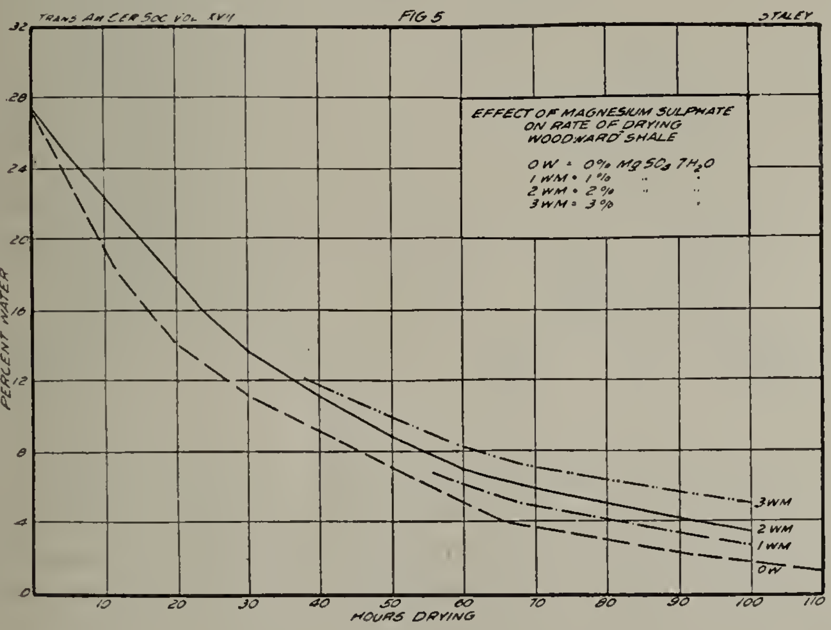

Fig. 5

1. It reduced the heat treatment necessary to produce a given degree of vitrification by from one to three cones.

2. It enabled a more nearly complete degree of vitrification to be produced than was at all possible in the case of the intreated clay.

3. The temperature of overfire was not lowered. This, in connection with the effects noted in 1 and 2, produced a much longer and safer vitrification range.

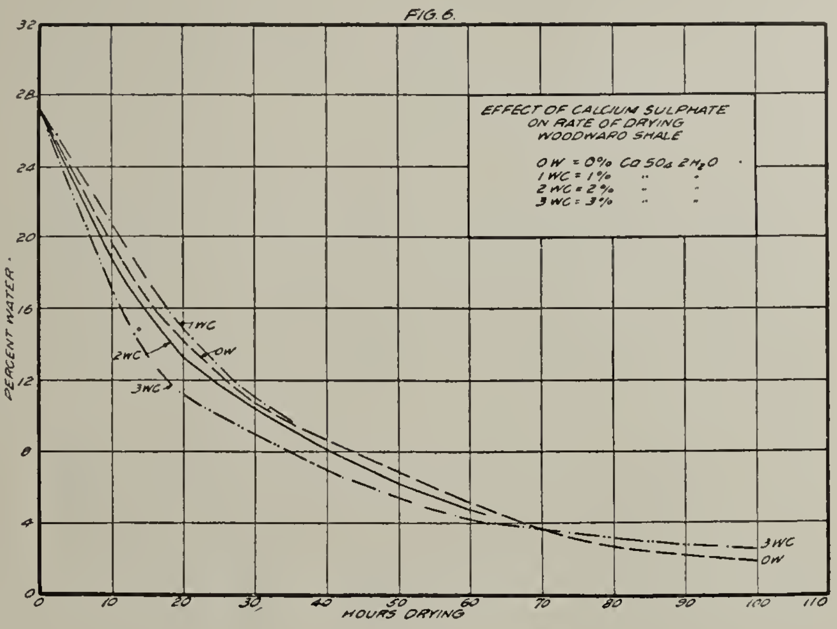

Fig. 6

As might be expected from the vitrification behavior of sandy clays, the most marked and beneficial effect of salt on vitrification was produced in the loess. As the mixtures became less sandy, the effect of the salt was less noticeable. As the result of these experiments, one-half of one per cent. of common salt is now being used with Clay A in the manufacture of brick in an Iowa factory. The results are even better than were hoped for from the laboratory tests. Cracking in drying is reduced. The firing temperature is lowered to such a degree that the saving of fuel more than pays for the salt treatment; and the product is absolutely free from scum.

THEORETICAL EXPLANATION

It is not feasible to give in this paper a detailed discussion of the many interesting theoretical considerations involved in the effect of salts on the drying behavior of clays. We can only mention a few points.

A. Any salt dissolved in water lowers the vapor pressure of water and its rate of evaporation. Other things being equal, it will also increase the amount of hygroscopic moisture on any surface.

B. Salts that cause deflocculation of the particles of clay of colloidal (very minute) size tend to produce an open structure in the clay that favors rapid evaporation and poor capillary action.

C. Salts that cause flocculation tend to produce a structure permeated by a multitude of fine capillary channels. This produces slow evaporation from the surface of the ware and adequate replacement of the evaporated water by a supply drawn from the interior of the ware by capillary action.

From the data presented, it will be seen that, in nearly every case, whatever cracking occurred took place in the early stages of drying, when there was little difference in the amount of drying that had taken place or in the rate at which it was progressing at the time. The difference was that, in the case of the untreated clays and the clays treated with deflocculants, (for these particular clays in the proportions used), the drying took place largely from the surface layers. In the case of clays treated with coagulants as fast as moisture was evaporated from the surface, it was replaced by water drawn from the interior of the sample by capillary action.

CONCLUSIONS

Soda ash, i. e., anhydrous sodium carbonate (Na_2CO_3), decreased the rate of drying as a whole in the clays studied and increased the tendency to cracking. It had a tendency to lengthen the vitrification range, but would not be an economical or desirable addition to most clays for ordinary processes of manufacture.

Common salt (sodium chloride-NaCl) decreases the rate of drying at all times, in most cases increases shrinkage, produces better colored ware, and has a beneficial effect on vitrification behaviors, especially in sandy or loess-like clays. The use of additions of common salt in amounts of from one-fourth per cent. to possibly two per cent. of the weight of the clay, is a feasible method of rendering workable many of the clays of Iowa that give trouble in drying and burning.

The use of magnesium or calcium sulphate as an addition to clays would not be desirable on account of the harmful effect on the burning properties of the clay.

The reduction of cracking in drying is due to the fact that certain salts (coagulants under the given conditions) produce a structure favorable to capillary action, and therefore as fast as moisture is evaporated from the surface of the ware, it is replaced by water from the interior which in turn is evaporated.

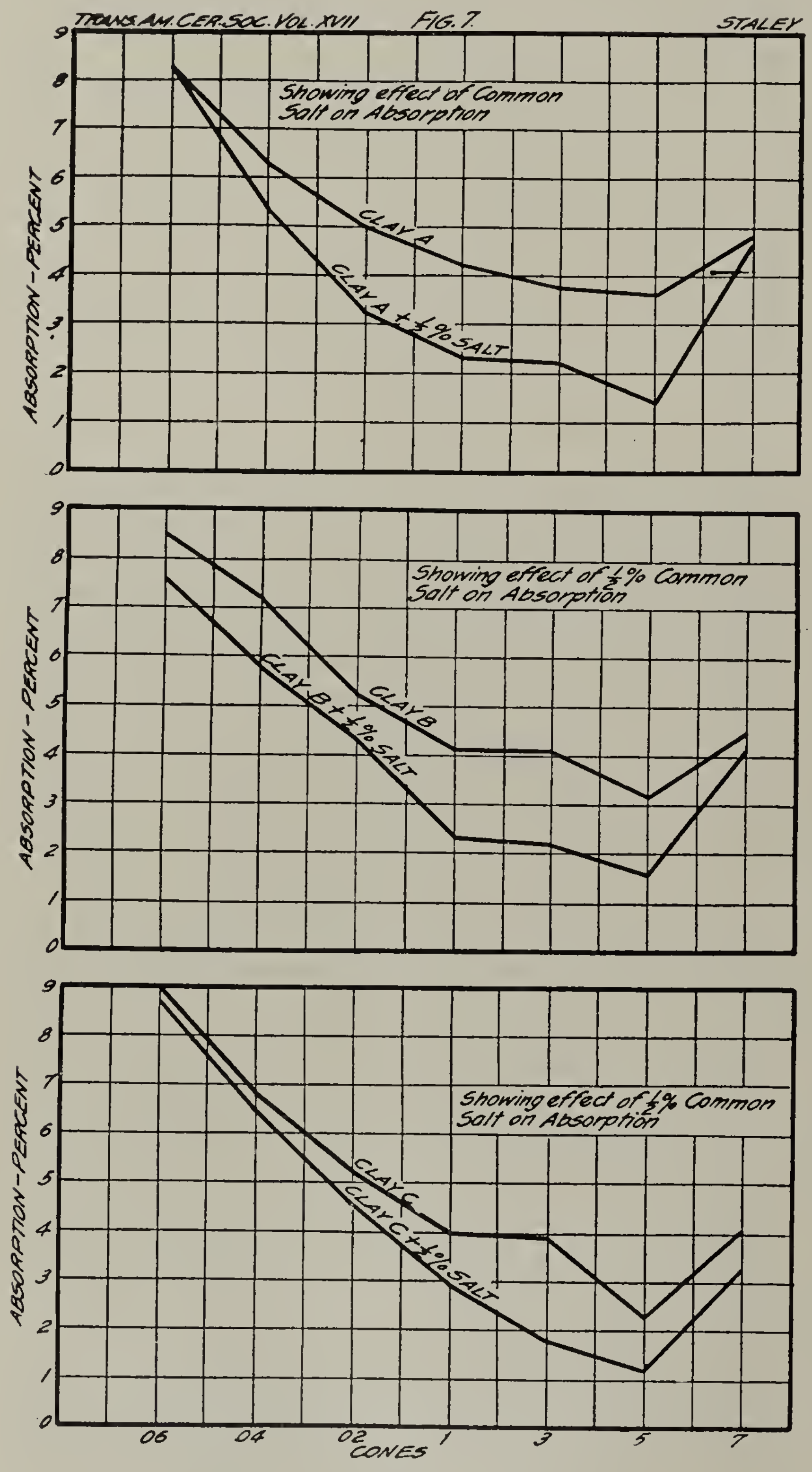

Fig. 7

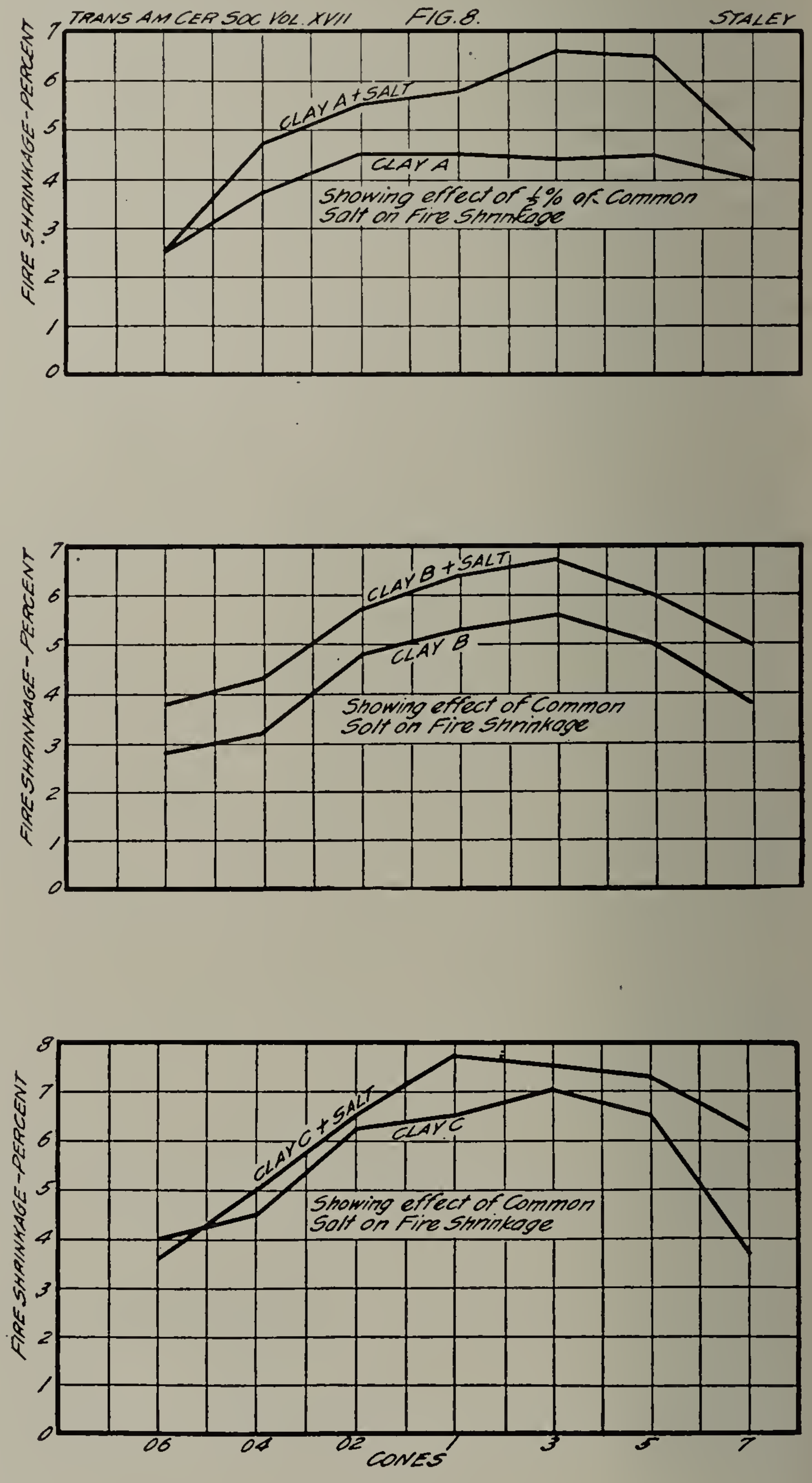

Fig. 8

New Brick Roads in Florida to be Grouted

Florida these days is literally "eating brick." The building of dependable highways has been given a very strong impetus during the past year by the introduction of new constructional methods which make for durability. In Volusia county recently a contract was let to the Southern Clay Manufacturing Company of Chattanooga, Tenn., for 200,000 yards of 3½-inch wire-cut-lug brick pavement to be laid in the Deland-Lake Helen district.

The brick in this pavement are to be laid on edge on a natural soil foundation and then grouted. This road will be about twenty-six miles long and nine feet wide, except in Deland. In the latter place the roadway will be paved fifty feet wide. Many miles of this type of road were constructed in Orange county in 1915 and a large amount of yardage will be built in other sections during the present year.

The SUPERINTENDENT

Helpful Hints for Practical Men Whose Problem is Maximum Production With Minimum Cost

Preventing Loss by Keeping Dies Fit

Due to a lack of sufficient care, many plants making hollowware suffer an unnecessary loss from the poor condition of dies when they are replaced on the machine after having been removed and lain idle for a time while some other size was being used.

In a comparatively short period, the highly polished surfaces of the die, which were produced by the flow of clay over them and which caused so little trouble before the dies' removal owing to the small amount of friction that resulted from its use, soon become rough when not employed. The result is that, when the die is replaced, it takes a heavy toll in spoiled ware, involving a corresponding loss of time, labor and some materials, before regaining its former standard of efficiency.

For this reason care should be taken to preserve the smooth surfaces when the die is removed from the machine. A simple method of doing this is to dress the die with a heavy coating of oil. No particular brand or kind of oil is necessary, as any thick lubricant capable of adhering to the die for a period of time and thus preserving its protective qualities, will suffice.

Cutting the Cost of "Dolly" Upkeep

In the April 18 issue of this magazine, on page 743, an item appeared in this department which dealt with an appliance that, when attached to the end of a clay car, aided in keeping the wire cable on the "dolly" and the car on the track. This article has led to another suggestion regarding the proper form of "dolly" to use in hauling clay by the drum and cable method.

The nature of the work that these little metal spools must accomplish is such that they receive a tremendous amount of wear and hard usage, in many cases their "lives" being limited to less than a month. Especially is this true on large plants where heavy hauls are made at frequent intervals.

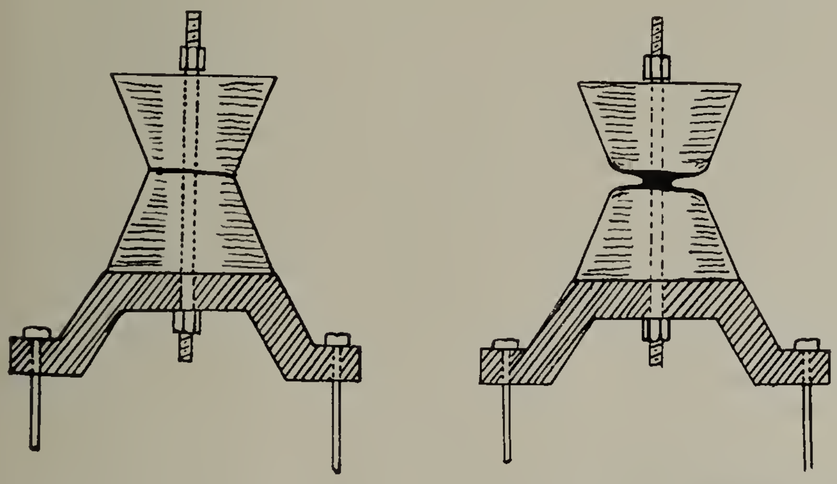

Fig. 1. Relatively Small Wearing Surface of Double-Cone "Dolly"—the Cause of Its Short Life

However, the short period in which they are in service, is due, in many cases, to the shape of "dolly" used. That pictured in Fig. 1 represents a common form—one that wears our very rapidly. With this type, the cable catches on the upper or protruding edge and quickly works down into the center which is the part that receives the most wear. The result is that in a short time it is actually cut in two, not only entailing some expense in replacing the worn out "dolly" but consuming valuable time. Both of these items run the expense of upkeep on these "dollies" to a high figure in proportion to the importance of the appliance.

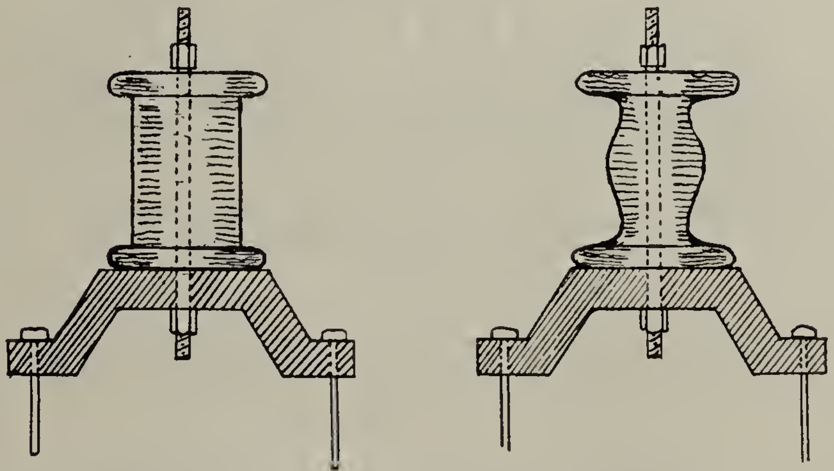

Fig. 2. Comparatively Large Area of Wearing Surface Increases the Service of the Spool "Dolly"

Another type in use on many plants is shown in Fig. 2. This has been found to serve the purpose as well as that shown in Fig. 1 but lasts for a much longer period. The reason for this is easily seen. Instead of one small zone receiving all of the wear, it is distributed over the entire surface of the spool. As much freedom of movement is obtained with the latter as with the first mentioned type, and the small amount of play allowed the cable in running on the "dolly" is not objectionable. The few good points in favor of the "dolly" shown in Fig. 1 are greaty overbalanced by the longer period of service offered by the second type.

One Way to Improve the Rattler Test

Many manufacturers of "pavers," who make a repressed brick and work with a high-grade shale, are puzzled at times to account for the abnormal rattler losses that are often obtained in a test. This is especially true in view of the fact that particular attention is being given each division of manufacture from the pit to the loading platform. However, it seldom occurs to the manufacturer that the trouble may be located at the repress machine.

There, the brick are subjected to the pressure of the plunger after receiving a coat of oil, and are then conveyed from the machine on the off-bearing belt from which they are caught by the hackers to be placed on the drier cars. Both the speed of the machine and the oily surface of the brick make it a very difficult task to handle them. It is often the case that, in "grabbing" the brick at this point, the hackers spread the whole hand over them, squeezing the "green" ware rather hard and causing a pyramid-shaped fracture that invariably opens in the drier, or if it is successful in passing this stage without

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showing the defect, the high temperature of the kiln is sure to bring it out.

Altho the fracture may not be noticeable to the superintendent even in the finished product, its presence is soon made known by a poor test in the rattler. Every crack or fracture, whether inside or out, combines to lessen the power of the "paver" to stand up well under the test. At times the effects of rough handling at the repress are more noticeable than at others, a strip of about one-eighth inch often peeling off the entire top of the brick as a result of a particularly hard squeeze given by the hacker.

A way to overcome this difficulty is to pay more attention to the method followed by the hackers in handling the brick when placing them on the drier cars. It should be seen that they are handled in such a way as not to damage the structure of the "green" ware. This can easily be done by taking hold of the brick with the thumb on one side and the fingers on the other side, not allowing the palm of the hand to touch the brick. The reason for this is that, where the brick are gripped so that the palm touches the top, a strong pressure is created in three directions—downward and to both sides—which invariably sets up sufficient strains to cause a rupture in the brick, whereas if it were picked up by the gentle yet firm pressure of the thumb and fingers, no damage would result.

Improving the Quality of Fire Brick

Some manufacturers of fire-brick, says the "Brick and Pottery Trades Journal," consider that when a brick has once been burned, it is capable of being made more heat-resisting, if it is burned a second time, and that each subsequent burning (if the temperature is not excessive) improves the quality of the brick.

It would be interesting to know how this idea originated, for in some ways it is curiously at variance with the fact that the longer a fire-brick is used, the greater the proportion of vitrified matter produced in it with the result that the brick may possibly increase in resistance to acids, but it can scarcely increase in heat-insulating power. It is, of course, a fact that brick which are continually heated to a very high temperature tend to lose some of the alkalies originally present by means of their volatilization. A careful inspection of steel furnaces will usually show condensed scummy patches which contain both alkalies and silica, and there are good reasons for supposing that these patches (or rather some of them) have been formed by the volatilization of part of the alkali in the clay and a condensation of these materials in a cooler part of the furnace.

The total amount of alkali volatilized is always small, and it is usually quite insufficient to make much difference in the heat-resisting power of the fire-brick, altho it must clearly have some influence in this direction.

One of the greatest arguments used in favor of grog as a large constituent of fire-brick is based on the idea that it is more resistant to heat than clay which has not been burned. The proportion of grog which can be mixed with British fire-clays is not large enough for any appreciable benefit to result, but on the Continent, where the brick are chiefly made of grog, the particles of which are cemented together by a plastic clay, it is a matter of great importance.

One possible explanation of the idea that burned clay is more heat resisting than raw clay made into brick, is the great difference between the sensitiveness of these two materials to sudden changes in temperature. If a clay brick is subjected to a sudden change in temperature before it is burned, it may crack and fall to pieces, but a brick which contains a large proportion of grog will not be damaged except under unusually trying conditions. To describe this as showing that burned clay is more refractory than raw clay is, however, a misuse of terms, for the difference in behavior does not lie in heat resistance in the strict sense of the term, but in sensitiveness to sudden changes to temperature.

It is interesting to observe that the best fire-brick on the Continent have, for many years, been chiefly made of broken saggers sold by the large porcelain factories. These factories use as many of the broken saggers as they can for the production of new ones, but there is always a surplus which is eagerly bought by the fire brickmaker as a valuable ingredient for his goods. Some of these saggers have been used a large number of times and they contain grog which has been used in previous saggers. There must be portions of some of these saggers which have been heated forty or fifty times. A material which has been heated so often should prove of great value, provided the fluxing materials in it have been gradually volatilized and have not continued to react on the clay, and form a larger proportion of fluxes. The latter reaction occurs in some instances and gradually brings about the destruction of the sagger. Much depends upon the temperature reached and on the nature of the atmosphere inside the kiln, as under favorable conditions, the alkalies appear to form such complex and refractory compounds as not materially to affect the heat-resistance of the clay as a whole.

Probably the improvement in quality which is observed in brick which have been re-burned, is largely due to the effect of the longer exposure to heat, and it is probable that, if the first heating has been prolonged so as to compare in duration with burning the two heatings, an even better brick would have been produced.

Putting Windows in the Stack

Belching smoke stacks in the big cities may mean a loss to the owner in more ways than one. In the first place, he feels it in the size of his bill for fuel. Of this loss he may not be conscious. But in metropolitan centers where anti-smoke ordinances are in effect and are enforced, if he is heedless of the dollars going up the chimney in black smoke, he runs a sharp risk of having the fact brought home to him in a manner that he will not soon forget. One or two fines for violating the smoke ordinance is an addition to the fuel bill that can't be overlooked.

"But how is a manager going to know that his stack is belching forth too much black smoke? You can't expect him to stand outside and watch his chimney all day long, or even expect his fireman to do so."

There may be other ways of safeguarding the fuel account in this respect than the one devised by a Chicago (Ill.) manufacturer, but this does its work well.

Thru the breeching, just beyond its junction with the boiler settings, he has inserted two short lengths of galvanized piping, about eight inches in diameter. These are in a horizontal position and exactly opposite one another. The one is sealed with a concave cap, painted with aluminum paint on the inside and houses an electric light bulb. The other is "plugged" with a piece of window glass, neatly fitted. It looks out at a point where the fireman must pass frequently in going to and from the coal bins. Each time he passes, he glances thru the window and the light shining from beyond thru the traveling gases en route to the stack reveals the relative blackness of the smoke just as effectively as if they were silhouetted against the sunlit sky, while nearby on a convenient hook, he has his smoke-density chart.—"Factory."

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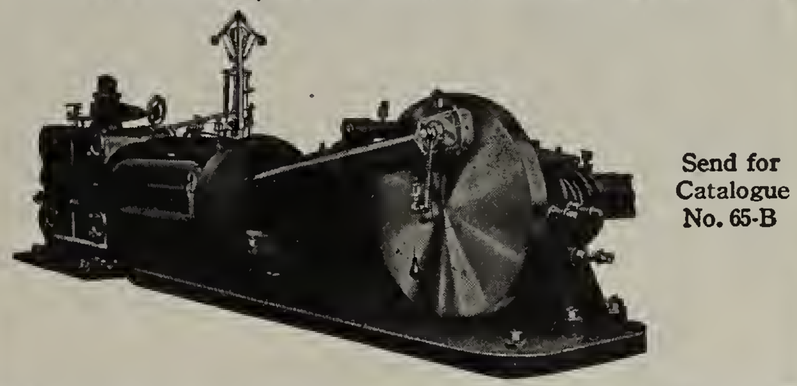

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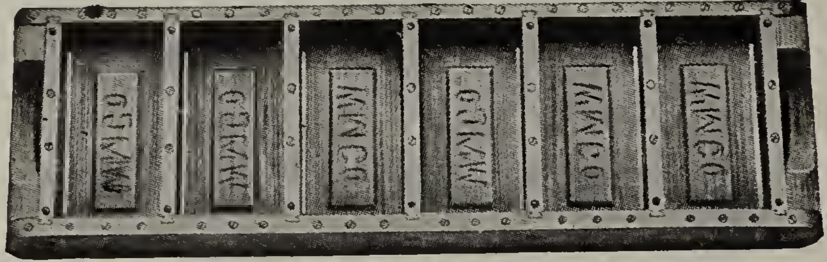

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Proper Dimensions for Drain Tile Kiln

773. *Indiana—We intend installing some round, down-draft kilns for burning drain-tile and will either build them 37 feet wide with 8 feet to the square, or 40 feet with 6 feet to the square. Now, we know that the majority of drain-tile kilns are 8 feet to the square, but think that 6 feet to the square and a larger diameter will allow the heat to go down more quickly and possibly save fuel. Please advise us if you know of any round down-draft drain-tile kilns that are built with only 6 feet to the square and which would you advise building? By 6 feet and 8 feet to the square, we mean the height of the kilns from the floor to the top of the side wall upon which the crown rests or, in other words, the distance from the base of the crown to the floor. As we figure it, with a 37-foot diameter this measurement with 8 feet will hold approximately as much as a 40-foot diameter with a distance of 6 feet from the floor to the base of the crown.*

We would suggest, by all means, that you build your kilns at the lower diameter limit of 37 feet with a distance of 8 feet from the floor to the spring of the arch. The reason for this advice is that, in building 40-foot diameter kilns, structural and depreciation difficulties occur that make a kiln with a small diameter more desirable.

For instance, it would be considerably more difficult to build a solid, substantial 40-foot crown than a 37-foot crown. Also in building a 40-foot diameter kiln with 6 feet to the spring of the arch, the doorways can approximate only 4 feet 6 inches in height, making the kiln difficult to set, draw and cool.

We note that you believe a kiln of larger diameter will allow the heat to go down more quickly and possibly save fuel. However, the speed of burning should not be dependant upon the height of the side walls, especially when they are not over 8 feet. The obtaining of speed in burning is entirely the function of setting, the construction of the floor bottom and the amount of draft.

In setting drain-tile the open, cross-sectional area is great so, in this case, the setting objection is eliminated and a deep, clean, well designed floor bottom coupled with sufficiently controlled draft, will produce quick burns.

In our estimation a 37-foot diameter with 8 feet to the square or 8 feet from the top of the floor to the spring arch is, in every way, the most desirable kiln.

Chemicals Cannot Produce Flashed Ware

769. *Missouri—We wish to know if there is a chemical that could be used with a clay direct or in a slip form, that would produce a fire-flashed ware. Fire-flashed ware, as we understand it, is produced in the burning by the action of flame, smoke and gas and by direct contact along the kiln flashed walls. We are trying to find out if flashing could not be ac-*

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complished with some other substance than the methods commonly used in most plants.

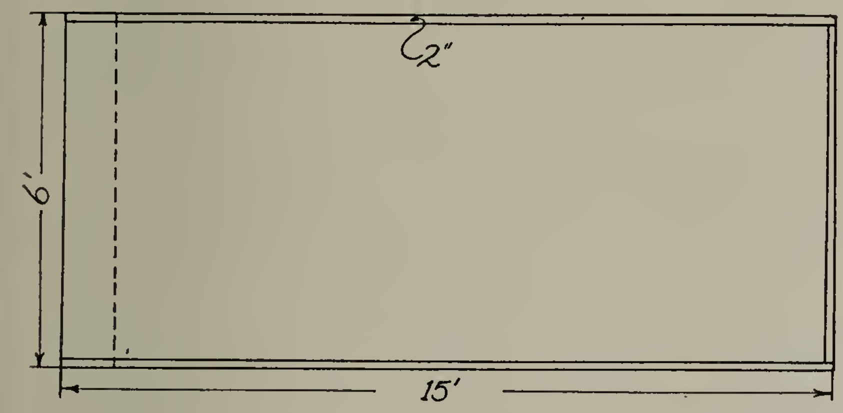
We do not know of any substance that could be added to a clay to produce the effects now brought about by the process known as "flashing."

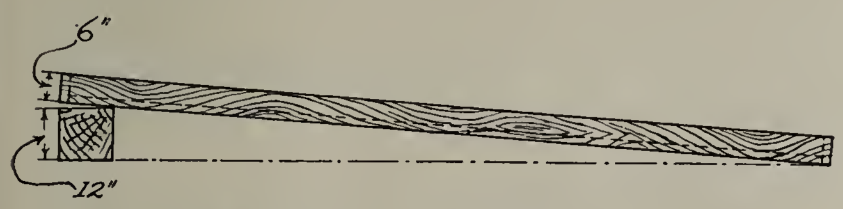
In some cases, in burning a flashed ware, it is necessary to add iron filings, fine machine-shop waste or iron oxide from various sources to the clay in order to increase the intensity of the flash or to produce a dark or brown speckled effect. However, the color is obtained in identically the same manner as in cases where the above mentioned materials are not used,—that is, by fire flashing, which is the result of oxidation or reduction, or both alternately.

In no instance has there been produced by synthesis anything approaching the results obtained from clays naturally containing the minerals (usually oxide of iron) which are essential to successful flashing. This is due, perhaps, to the fact that it is almost impossible to secure the intimate mixture and fineness of grain that nature produces in the raw clay.

A Low Cost Device for Washing Sand

774. *Virginia—We are having quite a little trouble with our molding sand as the local material has too much vegetable matter and sandy loam to make it work satisfactorily. We have tried washing it, and in this connection, have secured better results, but our method of washing is very crude. Can you tell us how to make an inexpensive washer with a capacity of two cubic yards of sand a day?*





A low-cost device for washing sand is shown in the accompanying illustration. In order to make this appliance, we would suggest that you construct a platform from ten to

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W. E. CALDWELL & CO.
(Incorporated)
LOUISVILLE, KY.
Tanks { Steel-Wood Galvanized } Towers
Wind Mills - Pumps - Gas Engines

Do You Need Dryer Cars?

Cars that are built heavy and strong—cars that will not warp—cars that will resist for years an alternation of low, wet heats and high, dry heats—cars that will stand rough handling—that only need oil to keep them moving, and bearing full loads, season after season. We have such cars and on these cars we guarantee satisfactory service, and on our Special Cars, Turntables, Grate Bars and Grey Iron Castings.

Pettigrew Foundry Co.
Harvey, Illinois

Drier Doors That Hold the Heat

No matter what type drier you have, you need to equip it with the

"Carrier" with One Door Lifted.

Perfected Dry Kiln Door Carrier

Doors can't warp or get out of shape—easy to operate—only one carrier needed for each battery of doors.

Made for doors from 2' to 8' wide and 5' to 8' high. Made for wood or fireproof construction.

Write for catalog B2 and all details.

Sold on 60-day trial.

Dry Kiln Door Carrier Co.
Indianapolis, Indiana

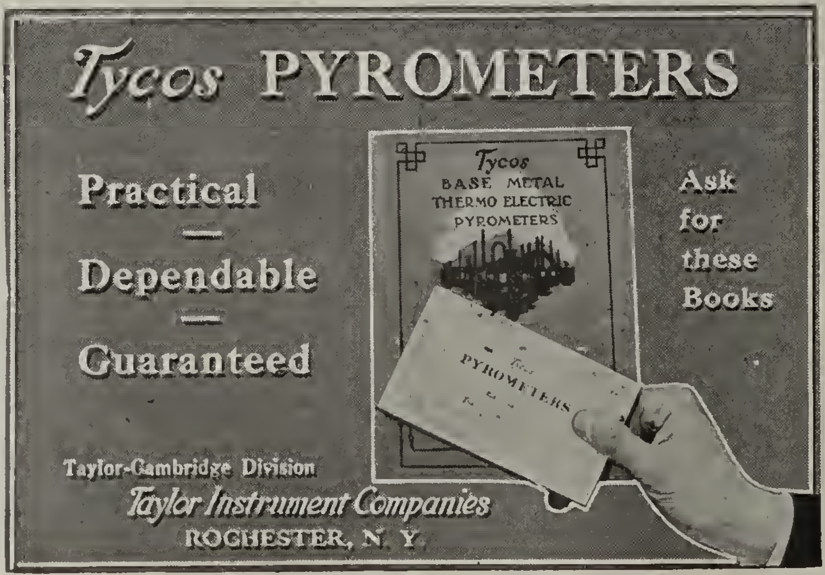
COAL For All Ohio Clay Plants

We have a splendid coal, perfectly fitted to burning in periodical and continuous kilns. It is

Pittsburg No. 8

This coal will save you money, you burn less to get better results more easily. Inquire now from

The Cleveland-Belmont Coal Co.
505 Republic Building
Cleveland, Ohio



Tycos PYROMETERS

Practical — Dependable — Guaranteed

Ask for these Books

Taylor-Cambridge Division
Taylor Instrument Companies
ROCHESTER, N. Y.

fifteen feet long by six feet wide. Make one end of the platform twelve inches higher than the other and nail a 2x6 around the sides and lower end, placing the apparatus at a point where there is good drainage or where the water flowing over the end can be disposed of. Spread the sand on the platform in a layer four inches thick and wash with a three-quarter inch garden hose, starting at the high end and allowing the water to run thru the sand and over the 2x6 which is set on the edge. However, in order to get the best results with this device, the amount of loam or clay in the sand should not exceed five per cent.

Plans Change in Type of Fuel

772. *Minnesota—We would like to get some advice on how to set a common scove kiln in which to burn coal. We have been burning wood, but wish to change to the first mentioned fuel. We set our kilns thirty-eight brick long by forty high when burning wood, with four-foot grates. Would not this make the distance from the end of the grates to the center of the arch too great for the efficient burning of coal?*

According to the information which you give, your kilns are approximately twenty-six feet wide, inside measurement, with two four-foot grates to the arch, leaving eighteen feet of the width which is not furnished with grates.

To burn with coal on the above plan would be very difficult, inasmuch as the lower center of the kiln will be backward in absorbing the heat. If possible, we would suggest that you start your burns with wood in order to get this portion of the setting heated. After this has been accomplished and the platting on top of the kiln partially closed or tighter than at the beginning of the burn, we feel that you can change over to coal and finish with this fuel.

In this connection, we would suggest that longer grates would help the situation considerably.

States Using Natural Gas as Fuel

771. *West Virginia—We would be glad to know how many states and what states use natural gas to any extent in burning brick.*

Among those states in which natural gas is used for the burning of clay products are included Pennsylvania, New York, Ohio, West Virginia, Kentucky, Arkansas, Kansas and Texas. Oklahoma, southern Illinois and California may also be included in this list, as well as Louisiana, which we understand is a new recruit to the gas burning fraternity. It might also be mentioned that some Canadian clayworkers are also using natural gas in their kilns.

The cost of gas in northern Texas is very low and, while the supply is not so good in that particular portion of the country as it has been in the past, still there are new wells being opened occasionally. Kansas has been particularly unfortunate in its experience with the use of natural gas in the manufacture of brick, many plants in recent years having had to "give up the ghost" because of the failure of the source of supply.

Has Trouble with Semi-continuous Kiln Crowns

770. *Quebec—We have a semi-continuous kiln with chambers twenty-eight feet ten inches long by fifteen feet wide, with walls six feet from floor level to the spring of the arch and with a height of four feet six inches from this latter level to the top of the crown. We have a great deal of trouble with the crown and feel that it may possibly be due to its being*

too flat. Are we right in this conjecture? If so, what should be the proper height of the crown?

We hesitate to say that the crown as indicated in your question is too flat, yet feel that a larger rise would be better. The width of the kiln, which you give as fifteen feet, with a rise in the crown of four feet six inches is ordinarily all right and within the limits of what is considered good kiln construction. In the absence of additional data, we would suggest that it would be wise to try a slightly higher arch the next time the kiln is rebuilt.

Your trouble may be in careless masonry work, that is using too much mortar in the riser joints or not absolutely insisting that the keys be driven in hard with a sledge.

Do not allow the masons to butter the brick but dip them in a thin slush and hammer them into position with light yet positive taps, and then be sure that the keys do not slip into their position over one-third to one-half before it is necessary to hammer them home.

Reducing Line Shaft Losses

Power losses thru line shaft bearing friction are too often considered negligible. How great these losses really are and one way in which they may be reduced was discussed by J. J. Gillespie, before the National Boot and Shoe Manufacturers' Association. An excerpt from his paper which was published in "Factory," reads:

"Proper consideration should be given to the advisability and desirability of reducing the loss of power due to friction to a minimum. To be more specific—rather than use the ordinary babbitted type of bearing, a roller bearing of accepted type should be made use of because this tends to reduce the frictional load appreciably.

"The average plant, when equipped with babbitted bearings and long drives—the same not being properly attended to and being more or less out of alignment and the bearings more or less worn—frequently shows a loss in transmission of power that will run from forty to fifty per cent. A roller bearing of accepted type will reduce this loss to not more than twenty-five per cent.

"In this era, you cannot afford to ignore the tools or appliances that will net you the greatest return on your investment, and the saving may properly commence at the coal pile and is just as important commensurate with its value as any department thruout your factory."

Seeds of Success

Exceptional success depends not upon exceptional opportunity, but upon the ability to make use of ordinary opportunity.

A Laura Jean Libbey diet is not the best mental food for a man who wants to develop his brain, any more than dill pickles are the best physical food to make strong muscles.

When you put your name on another man's paper for more money than you can afford to lose, you are unlocking the door to the bankruptcy court.

You are a mighty wise business man if you can always distinguish where economy ends and legitimate expense begins.

Even tho we disagree with the opinions of the optimist, we can't help liking the atmosphere surrounding him.

There is a loss goes with carrying a larger bank account than you need just as surely as in loaning money on a non-interest bearing mortgage.

Taking a trade journal or a business magazine and not reading it, is just like sending for the doctor and then refusing to let him see the patient.

Boss Ten Hour DRYER
The only tender clay dryer on the market

Boss System of BURNING BRICK
Will easily cut your present fuel bill half in two

COMMON SENSE APPLIED TO

Drying ORIGINAL Boss SYSTEM **Burning**

Write today for a catalog

JOHN C. BOSS COMPANY
Monger Building, - Elkhart, Indiana

HILL FRICTION CLUTCHES
SMITH TYPE
STRENGTH

Great mechanical stability, and accessibility are two important features of the improved Smith Type Hill Clutch. Vise-like jaws grip the ring in pairs. No springs are used. Clutch is self centering.

Send for Catalog

The HILL CLUTCH COMPANY
Cleveland, Ohio

Investigate Our Line

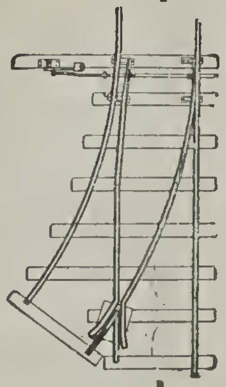
Dies for Clay Working, our Specialty. Brick, Fireproofing, Plain and Ornamental Hollow Ware Dies, for Auger or Steam Press; Piano Wire Clay and Sand Screens, Conveyors, Elevators, Dry Pan and Pug Mill Automatic Clay Feeders, Friction Winding Drums.

The Louisville Machine Company
Louisville, Ohio
Patentees of *The Roller Process Paving Block System*

Industrial Track Equipment

Everything in switches, crossings, frogs, switch stands, rail braces, tie plates—ready to be shipped promptly on receipt of your order.

Ask us for quotations on your industrial railway needs.



The Cincinnati Frog & Switch Co.
Cincinnati, Ohio

Some of the very best plants are
DRILLING
BIG BLAST HOLES
WITH A
CYCLONE DRILL

In some cases the drill has saved its original price in three months' use.
Send for Bulletin B 4.

THE SANDERSON CYCLONE DRILL CO.
ORRVILLE, OHIO

Durability and Dollars

When your rope breaks, your work stops; therefore, lack of durability means a loss of dollars.

RED STRAND
HERCULES WIRE ROPE
REG. U.S. PAT. OFF.
The Original Colored Strand Wire Rope

is wear-resisting at every point; consequently, its use means fewer rope changes, minimum loss of time, and greater profit.

Write for catalog.

A. Leschen & Sons Rope Company
ST. LOUIS, U. S. A.
New York Chicago Denver Salt Lake City San Francisco

"Rust Special" Clay Feeder

It Eliminates Two Men
A Saving of Twenty-Four Dollars Per Week
It Performs Their Work—Perfectly
Ask for the "Rust" Bulletin
MARION MACHINE, FOUNDRY & SUPPLY CO.
Box 395 MARION, IND.

With your Shovel ?
In a hurry ? Must have clay ?
The Beam swings and drops,
Rips and rams
For dipper load—
Swings back—then dumps—
and the chains—"They will not break"
if they're WOODHOUSE SPECIALS
We'll tell you why.
WOODHOUSE CHAIN WORKS Trenton, N. J.

SAY "I SAW IT IN BRICK AND CLAY RECORD"

The SALES-

Short Stories That May Help the Salesman Who Aspires to Salesmanagership and the Salesmanager Who Wishes to Retain His Ability to Close Big Deals

Finding a New Outlet

Anyone can follow the usual sources of demand and call upon the obvious prospects, but it takes a man with real brains under his hat to dig up business when the usual avenues to trade are closed.

An instance of this kind, which the writer has in mind, was brought to light not so very long ago, when the greater part of a large shipment of paving-brick was rejected because of alleged defects. The manufacturer did not intend to argue whether the rejection was justified or not. But the fact remained that he had a lot of material laid down in a market far from home with transportation added to the manufacturing cost. The question that presented itself was how to dispose of the brick to the best possible advantage so as to reduce the loss on the shipment as much as possible.

The salesman on the job looked around and admitted that the situation was perplexing. Inasmuch as the brick had been rejected, they could not, of course, be sold for other municipal work, and so the problem was how to place them in other directions. After considerable thought, the salesman decided that it was up to him to sell the material in small lots to individual consumers.

He jumped into an automobile and rode all over town, calling on every coal dealer and finding, as he expected, that the driveways thru their yards and around the stables were in bad condition—in most cases not having any paving. He put his case plainly to the coal dealers—that the brick were a little below grade and could not be used for the paving work for which they were shipped, but that they would make splendid material for paving coal yards. In a surprisingly large number of instances, sales were made.

After having exhausted the number of possible buyers on the coal yards, the salesman called upon all of the large teaming concerns in the town, and found a great many who realized that the driveways around their property should be paved—with brick. He managed, in "fixing them up," to move the remainder of the condemned shipment. Incidently the price realized was sufficient to take care of all of the expense involved in making the shipment and the salesman's time, to say nothing of a substantial remainder which went towards covering the manufacturing loss.

The Material and the Job

Many salesmanagers figure that their duty is done when the order is signed, and that all that remains to be accomplished is to collect the face of the invoice and then forget it.

But those who are wise know that, in order to make the most of every sale, it is advisable to see that satisfaction is experienced and that the customer uses the material in the correct manner. In other words, the con-

MANAGER

If These Stories Help You, Let Some of the "Bigness" That Has Made You a Successful Salesman Cause You to Write Us One Selling Letter

struction end of the work is just as important to the manufacturer of the material as is its prompt and efficient delivery.

Nearly every clayworker knows how poor methods of construction hurt the paving-brick industry in the early days and how the efforts of the national association, in establishing standard specifications, put the use of paving-brick on the proper basis. In other fields conditions are similar—if the work is not done correctly, so as to insure the greatest possible service from the use of the material, it will be difficult to get repeat orders, thereby handicapping the work of the selling force to a marked degree.

A large manufacturer of terra-cotta is now furnishing a construction foreman to contractors at a moderate price, paying his transportation and expenses in many instances, in order to make sure that the product of the plant is being laid up so as to reflect the greatest possible credit to the manufacturer, and incidently the contractor and the architect. The result of this practice has been to extend the demand for this material, due to the fact that other architects, contractors and owners have learned of the excellent results which have come from the supervision which this plan furnishes, and are anxious to insure satisfaction for themselves and their customers by following a similar plan.

Using the Testimonial Idea

"Ask the man who owns one" is not only a well-known advertising slogan, but it is also an example of the effective use of an implied testimonial.

You, who have always regarded testimonials as something which people write about patent medicines, should take a look at the proposition from a fresh standpoint.

Consider that most people are strongly influenced by the opinion of others; that the recommendation of a friend with reference to a particular brand of shoes or make of automobile, carries weight because it is usually disinterested, and that this disinterested quality is what makes the testimonial effective.

"Ask the man who owns one," carries out the testimonial idea because, when widely advertised, it suggests that everyone who drives a Packard is going to be a "booster," and in effect informs owners of this car that they are expected to supply the desired testimonial. Inasmuch as they are thus put into the "limelight," as it were, they usually live up to the requirements of the situation.

Applying this thought to the business of marketing burned clay, it is important to make all possible use of customers who have been sold and are satisfied. In other words, if you can refer specifically to parties to whom your prospect can turn for information regarding the quality and service of your product, it will materially strengthen your sales argument.

A large manufacturer of hollow-tile, who is pushing this product for use in the construction of silos, uses the idea above described by publishing annually a list of all the

BALDWIN

You want a reliable, economical locomotive for service about your plant. Investigate the **Baldwin gasoline locomotive.**

These locomotives are reliable, because they are correctly designed and built. They are economical, because they consume no fuel while standing idle.

Record No. 74, which is yours for the asking, tells all about them.

THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA, PA., U. S. A.

WHATEVER equipment you need—don't buy until you know something about the

Lakewood Line

We Manufacture

Buckets, Kiln Bands, Pressed Steel Brick Pallets, Bearings, Portable Track, Ball Bearing Turntables, Switches, Richardson Double Die Steam Represses, also Miniature Hand Represses.

Cars of all kinds

Every piece of equipment is built of the best material by the best mechanics obtainable. The Lakewood Line is Built to Last.

Ask for Catalog No. 11

Lakewood Engineering Co.
Formerly the Ohio Ceramic Eng. Co. Cleveland, Ohio

"CONTINENTAL" BRICK BARROW

Correctly designed and perfectly balanced.
Built of No. 1 Air Seasoned Southern White Oak.
Rigidly re-enforced, and built for service.
Large wide tired wheels—steel or cast iron.
Babbitted Malleable Bearings—self oiling and dust proof.

SPECIAL "HYATT" ROLLER BEARINGS IF DESIRED

Just the barrow you are looking for.
What is the nature of your requirements?

CONTINENTAL CAR COMPANY, Inc.
PIERCE BLDG., ST. LOUIS, MO.
WORKS: LOUISVILLE, KENTUCKY

LEHIGH PORTLAND CEMENT CO.
LEHIGH
ALLENTOWN, PA.—CHICAGO, ILL.

The Cement for Paving Brick Grout

Lehigh is High in Strength, Uniform in Color and Fineness. You Don't Have to Guess with Lehigh.

Specify and Use Lehigh in all Brickwork. Remember the Mortar Joint is an Important Factor in the Wall.

Use Lehigh and Cease to Worry.

It Assures Satisfaction Under All Conditions.

LEHIGH CEMENT

Cement Grout for Permanence

owners of his silos, a separate book being gotten out for each state, with the owners in each county properly grouped. In this way the farmer who is interested can readily look up a silo owner in his immediate territory and find out all about "how it works." Obviously, a "boost" from a satisfied customer will come closer to getting an order than the solicitation of the salesman, without such help.

Work with the Other Fellow

Two heads are better than one, and so two salesmen can often get better results when they work together, than when they direct their energies in independent channels without regard for co-operation.

This applies well to the marketing of building materials. Many brick salesmen have found it worth while to co-operate with the representatives of other companies handling building materials lines that are non-competitive and non-conflicting. For instance, in the matter of new prospects, this practice is good business, if judiciously handled, as each selling organizaton naturally learns of some new jobs in advance of the other, and where each force has a different product to sell, by "pooling" this information, so to speak, all of the concerns are given a large number of possible buyers on which to call.

Sometimes a salesman from another house can tell you how to get consideration in a certain architect's office where you have never been able to get behind the rail which separates the outer office from the sanctum sanctorum. Another may be able to "tip you off" to personal connections which explain why you have not been able to secure business from a certain contractor, making it advisable to quit wasting energy in that direction, for it is just as important to know whom not to solicit as to know just who should be put on your prospect list.

If you can choose the righ man to co-operate with, and can depend on your confidence being respected, a plan of this kind can be made exceedingly helpful.

Selling Yourself

No qualification is more important to a man going into business in the employ of others than the ability to sell himself, his time, his services.

It is a fine thing to be able to sell for others and to get a big salary for doing it, but selling must begin right at home. It must begin with selling yourself *to* some one before you can start to sell *for* them.

Just as a salesman can always get rid of any amount of goods if he does not care what the price, so he can always sell his services to some one if it makes no difference to him how much salary he is to receive. Profitable salesmanship is never as easy as mere "unloading." Make yourself worth a good price and then do not hesitate to ask for it.

A young fellow once came to me and said:

"You don't want to get a cheap chauffeur, do you?" That was the last thing I wanted—a cheap chauffeur. My neck is too valuable to me. But I did happen to want a driver just at that time, and I would have been glad to hire a young chap who was willing to work at a comparatively low wage, but no "cheap" chauffeur for mine!

And there is no good employer of the sort a man wants to work for, who is going to hire employes who rate themselves as cheap. It is just like selling anything else. You are not going to find prospective buyers believing the goods worth more than the seller claims for them.

The man trying to sell his services should have enough

self-respect, a good enough opinion of himself, to command the respect of his prospective employer. Don't try to give the impression that you know it all, because you lack quite a lot of that, but show that you do know something. On the other hand, to get a position by overrating yourself can end only in a downfall. You know what happens when a man sells goods on the strength of a recommendation beyond what they will stand. He gets the goods back or he gets more complaints than he can take care of, and he is pretty sure to lose a customer.

Your ability to serve the man to whom you want to hire will in a considerable degree be judged by your ability to sell yourself, to present your personality and your qualifications in a pleasing manner. Study up in advance what you are going to say and do to make your selling talk as convincing as possible.

And after you have made the sale—bend every energy you possess to delivering the goods.

It is one thing merely to sell yourself, while it is another to stay sold. A new broom sweeps clean, and employers expect the new man to show his best side for a time; but the man who sells himself successfully is he who not only makes the sale and sweeps clean at first, but who continues to sweep clean.

Merely being glib of tongue and agreeable of presence so as to create a good impression and get hired will not avail much if you cannot "deliver the goods" so they will not come back on your hands. Your services are not going to be retained unless they give satisfaction.

The Semi-Monthly Trade Review

A SIGNIFICANT INDICATION shown in recent reports of national building operations and the general condition of trade, is that many sections of the country are beginning to show surprising increases in the value and number of new buildings projected, that have heretofore been conspicuous by their absence from the list of "boom" localities.

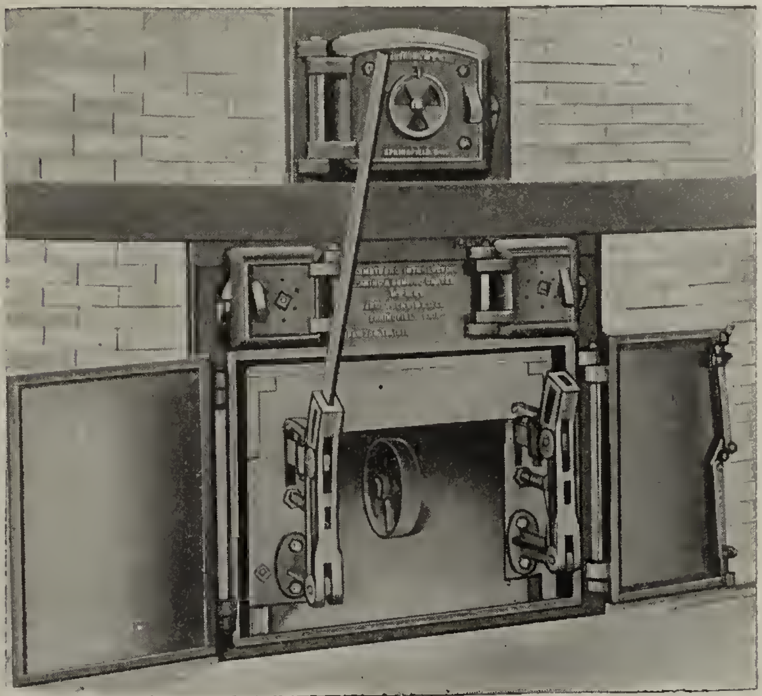
Prominent among the agencies that have been responsible for bringing this condition of affairs to light, is the report of March building which showed an increase of eighteen per cent. over the corresponding period of last year. In this connection it is interesting to note that San Francisco, Cal., registers an increase of seventy-nine per cent. when compared to March, 1915. The business returns of the first three months of the present year have been studied with far more than ordinary interest in San Francisco to ascertain whether any indications appear of

Armstrong Kiln Grates

Portable—Interlocking—Self-Contained
Shaking—Dumping

We will ship our Standard Interlocking Kiln Grate to any clay plant anywhere, install it at our own expense—if it is not satisfactory or does not give better service than any other kiln grate, we will remove it —and it won't cost you one cent.

It Will Positively Reduce Your Burning Costs.



We want to tell you more about these grates.

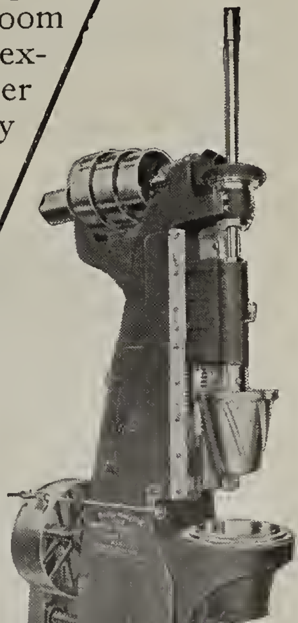
The Armstrong Manufacturing Co., Springfield, Ohio

A bi-product that is profitable

Place the machine off in one corner of your plant, and let it absorb the spare time of your machine room men. They soon become expert, and a stock of flower pots quickly collects, ready for the kiln.

It is almost pure velvet—a bi-product—a sure seller with a manufacturing cost low enough to insure a goodly profit.

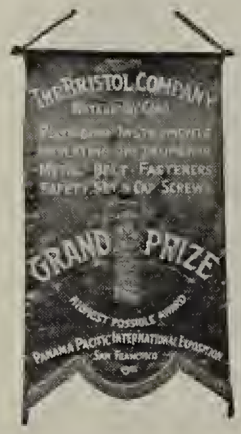
Send us sample of your clay and let us show you what our flower pot machine will do.



Baird Machine & Mfg. Co.
54-56 Jefferson Ave.
Detroit, Mich.

Bristol's Pyrometer Installation

For many practical applications of electric pyrometers it is desirable to have the furnace temperature indicated at the furnace operator's post of duty, and a recorder installed in the office of the superintendent. This combination indicating and recording unit of Bristol Pyrometers, as shown above provides for both these requirements. Highly recommended for brick kilns.



Write for Bulletin 205

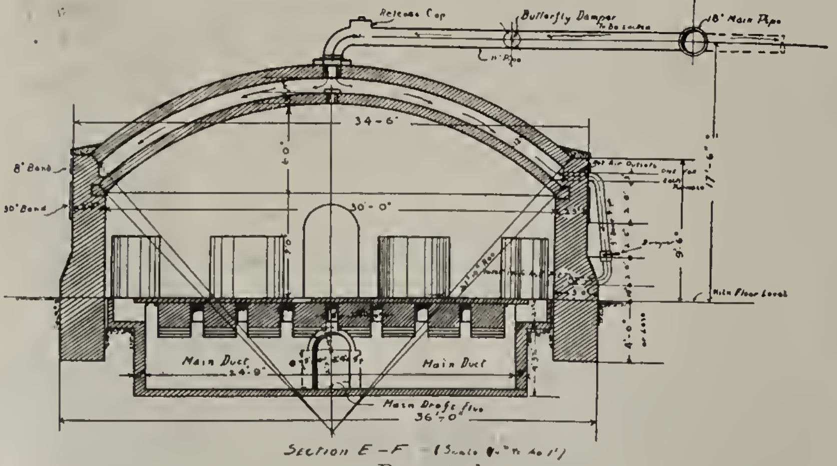
THE BRISTOL CO.
WATERBURY, CONN.

BRANCH OFFICES
BOSTON NEW YORK CHICAGO
PITTSBURGH SAN FRANCISCO

Can You Burn Shale Paving Brick in 30' Kilns at a total cost of $.97 per M?

It can be done with our attachment on your kilns. A truly marvelous saving, due to application of common sense principles. Ask immediately for information.

McManigal Grateless Furnace Co.
Logan, Ohio



Patented

It can be built on your present kilns

the much predicted post-Exposition slump, and it is with great satisfaction that the increase above mentioned in building is noted. In marked contrast to these encouraging signs, the Pacific Northwest still continues to lag in the amount of new building projected. Portland, Ore., for instance, shows a loss of thirty-two per cent. for March while more recent reports state that only a moderate building movement is under way in that city.

Des Moines, Iowa, is another of the "surprise" cities, reporting a gain of two hundred and thirty-five per cent. in March when compared with the corresponding period or last year. In addition to this, contracts for buildings in the business district now under construction or to be erected this year, aggregate more than two millions of dollars and there is a notable increase in plans for residence properties and other improvements in April.

SOUTHERN CITIES SHOW SUBSTANTIAL GAINS

The South is also showing great activity, where a year ago nothing but gloom prevailed.

Chattanooga, Tenn., shows a gain of three hundred and fifty per cent. for March, Montgomery, Ala., three hundred and seven per cent, Atlanta, Ga., seventy-one per cent. and Birmingham, Ala., twenty-two per cent. These are only a few of the southern cities that show an upward trend which indicates an extensive revival of business in that section. No doubt the prosperous condition of the steel and iron trade has had much to do with bringing about this satisfactory state of affairs, as has also a steady market for cotton. However this may be, the fact still remains that these conditions are creating an excellent demand for burned clay building materials, which, it is hoped, will more than off-set the past unprofitable year or two.

CHICAGO BUILDING TAXES INSPECTION FORCE

Building operations for the first third of the year in Chicago, Ill., surpassed all previous records for corresponding periods. If the pace continues, it is stated that Building Commissioner Bostram will be forced to ask for an emergency appropriation with which to hire more building inspectors. The frontage involved in the buildings projected to May 1 is more than nineteen miles, showing a gain of approximately sixty per cent. over the first four months of 1915. It is needless to say that material men in the "I Will" city are very busy. Brick sales are much above normal. Wm. Schlake, president of the Illinois Brick Company, in commenting on the situation, said:

"We look for the best season in several years. Orders are beginning to pile up and we are receiving more orders every day than we can supply. During the first quarter of 1916 we delivered about 100,000,000 brick, which is the best first quarter we have had for years."

In building construction in Chicago this year there is a decided tendency to erect fireproof structures. On this point Commissioner Bostram shows that in the first quarter, the average cost of structures as compared with last year was as follows:

	1916	1915
January	$3,393,000	$ 710,000
February	1,383,000	500,000
March	2,949,200	1,335,000

Commissioner Bostram states:

"The above tables shows an increase of $5,180,000 over the first quarter of 1915. As the year goes on, this per centage in gain will increase. The tendency at this time is to erect fireproof structures."

Forty-five cargoes of Hudson River common-brick

were sold during the week ending April 22 to dealers at the wholesale docks in New York. This total equals that of the week previous at prices which remain unchanged—$8.00 to $8.25 a thousand. Brooklyn was again the heaviest buyer, altho taking one less cargo than in the week previous, in comparison with which, Manhattan dealers took twelve cargoes, an increase of one. Manufacturers are still handicapped by the shortage of barges but are shipping as freely as they are able because of the higher range of prices.

The output of the Hudson River region this year is expected to be in greater volume than in previous years, despite the labor and transportation problems which are to be solved. New York City showed an increase of twenty-eight per cent. in building during March, this being entirely in the Boroughs of Manhattan and Queens.

BOSTON ON EVE OF ACTIVE SEASON

In Boston, Mass., unfavorable weather has prevented work on new buildings to some extent, but there is a feeling thruout the trade that activity in the near future will lead to a big demand for materials. More activity is shown in the building trade in Philadelphia, several large structures having been started and the volume of permits taken out displaying substantial expansion.

Newark (N. J.) permits and undertakings in new construction work are sub-normal, the reason assigned being the scarcity of labor and the high cost of materials. On the other hand, real estate operations in Baltimore are showing increased activity, including the erection of dwellings in the suburban districts and the building of warehouses and stores in the business sections. The New Orleans real estate market has been rather active during the past month, commercial property especially bringing high prices.

BUCKEYE STATE FAR FROM BEING SLOW

Activity in building in Cincinnati is responsible for an increased demand for clay products and it is believed that the movement in this line during the spring months will be above expectations.

Cleveland, Ohio, reports building operations as increasing rapidly while in Columbus, indications point to a good season in real estate which, of course, means extended building. In Dayton, building operations are expanding and materials are very active. The tile industry in Zanesville reports that business has taken on an upward tendency, collections being good and the outlook favorable. Pottery and stoneware manufacturers report orders of good volume and the situation in this line seems to be regarded as encouraging.

Indianapolis building operations continue to show favorably, the total value of improvements from the first of the year to April 1 being $1,655,709, a gain of $189,543 over the corresponding period of last year. Building operations in Minneapolis are increasing and extensive construction plans are being arranged for, among which is a million dollar addition to one of the Minneapolis flour mills.

In Kansas City, Mo., building operations are reported as being active and labor well employed. A gain of one hundred and thirteen per cent. in March building is reported from Denver, Colo.

The city commission of Owosso, Mich., is making plans for brick pavement on Washington street that will cost $21,900. The matter is now before the department of public improvements.

THE plant is at Canton, Ohio, but the bricks are used pretty nearly everywhere. "Metropolitan" is stamped boldly on the side of every one of them—*burned in to stay*, because the makers' quality makes the brand stand for something. Now

"MARIONS" Take Out the Clay for 200,000 "Metropolitans" Daily

—and as a proof of their respect for the way our Shovels do things, the Company has recently bought another "Marion"—their fifth—with the encouraging comment that if they need more equipment, "more 'Marions'" would be their choice.

We'll be glad to supply you with the facts, without obligation—just ask for Booklet A120.

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You can't get the kilns unloaded on time—You can't prevent accumulated demurrage on cars—You can't have satisfied hustling wheelers—

UNLESS

You have a fleet of
INVINCIBLES

Look!

IT IS BALANCED

The axle is **under** the load—NOT at one end of it.

It slides—down the runway—and the hind legs don't rip and tear.

It Rides Its Load

THE TORONTO FOUNDRY AND MACHINE CO.
TORONTO, OHIO

SAY "I SAW IT IN BRICK AND CLAY RECORD"

There is a man—
a manufacturer of fireclay products; he has used Canton Kiln Grates for four years.

This man saved 30% of his burning costs each year in the first three years.

Today, in the fourth year, he claims and is accomplishing a saving of—40%.

Are you neglecting an opportunity? In all fairness to yourself, to your trust, to your company—is it right for you to any longer neglect an investigation of Canton Kiln Grates?

We have dozens of sets in kilns. We will furnish you a set on a trial basis.

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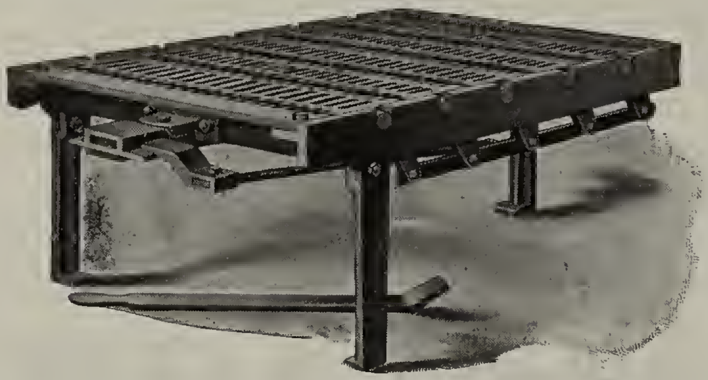

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STICKS — DOESN'T SLIP — LASTS

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Transmission
Elevating
Conveying
BELTS

The clay plants that are hard to sell to—are the plants that are using Hettrick Belting. It is quality stuff. Ask for information now.

HETTRICK BROS. CO.
TOLEDO, OHIO

IN *the* WAKE *of the* NEWS

Being Brief Mention of a Host of Interesting Happenings in the Varied Fields of Clayworking

ALABAMA

The Clay Products Company is the name of a new concern incorporated with a capital stock of $100,000 at Fairhope, Ala., to deal in all kinds of clay products.

The G. W. Eichelberger and Sons Company has been incorporated at Anniston, Calhoun county, Ala., with a capital stock of $30,000 for the purpose of manufacturing brick and tile. The incorporators of this concern are G. W. Eichelberger, P. M. Eichelberger, J. A. Eichelberger, and A. L. Eichelberger.

BRITISH COLUMBIA

A very instructive and interesting exhibit of drain-tile and hollow-tile fireproofing has been placed in the San Diego (Cal.) exposition by the Port Harvey Brick and Tile Company of Vancouver, B. C.

CALIFORNIA

The Grant Park Brick Company of Santa Barbara, Cal., has its first kiln of building brick ready for sale, and preparations are now being made for the manufacture of hollow-tile and face-brick.

The Pomona (Cal.) Brick Company, operated by William and James McMullen, is enjoying a season of unusual activity. While but one shift of workmen is at present employed, the pressure of the orders being received has made it necessary to consider an additional shift.

The opening of a new clay pit at Beltane, Cal., has caused the Southern Pacific Company to announce a reduction in the rate on carload shipments of crude clay from $1.25 a ton to 85 cents a ton between Beltane and San Francisco, South San Francisco, Oakland, Alameda and Richmond.

Extensive homebuilding and the erection of several large business blocks, together with a great amount of building repairs that are being made in Santa Barbara and Montecito, Cal., is keeping the plant of the Unit Brick and Tile Company of Santa Barbara running to capacity. The demand so far this year has been unusually good and the outlook at present is excellent.

COLORADO

Orders received recently by the Delta (Colo.) Brick and Tile Company reflect a good demand for drain-tile as well as for building brick in that section of the country.

A new brick plant is being built at Ignacio, Colo., by Jack McKimmon, who will engage the services of an experienced brickmaker to superintend the operation of the plant.

The Durango (Colo.) Pressed Brick Company will begin operations early in May, after a complete overhauling of its plant. A run of five months will be made, in which time two million brick will be burned.

Work is now under way on the building of the Jewett Fire Brick Company's plant, a new concern that will manufacture face and fire-brick at Canon City, Colo. A capacity of 20,000 daily will be reached at the start, this to be increased as the call for the company's product becomes greater. Railroad tracks are being laid and clay storage bins are being installed. The company plans to commence operations about May 20.

A new plant with a capacity of 10,000 brick per day is to be erected at Gunnison, Colo., by J. J. Cottrell, a veteran brickmaker. Mr. Cottrell has already leased a tract of land at Gunnison, upon which to build the plant.

The city of Del Norte, Colo., is about to put in a drainage system in the northern part of town, and has placed an order with the Standard Fire Brick Company of Pueblo, Colo., for five carloads of eighteen-inch salt-glazed vitrified drain-tile.

Feeling that it has been taught the lesson of unsafe frame construction by a fire that caused many thousand dollars worth of damage recently, the Golden (Colo.) Fire Brick Company is replacing the destroyed buildings with brick structures. New machinery has already been installed, the capacity of the plant increased and the capital stock of the company raised. Orders, which have accumulated during the period of reconstruction, are sufficient to keep the plant operating at full capacity for a considerable period.

CONNECTICUT

The Park Brick Company of Elmwood, Conn., has added a five-ton motor truck to its delivery equipment.

Virgil M. Palmer has purchased the plant and business of the Charter Oak Brick Company at Elmwood, a suburb of New Britain, Conn. B. H. Hibbard was formerly owner of this property.

H. S. Tallard and the Donnelly Brick Company, both of New Britain, Conn., have started making brick for the 1916 season. Several other plants in this vicinity are also about to resume operations.

With all indications of labor trouble fast disappearing and with building conditions excellent, brickmakers of New Britain, Conn., look forward to a very successful season. Many predict that production will be the largest in the history of the industry in that locality.

Brick manufacturers in Berlin, Conn., and vicinity are putting their plants in order in preparation for a busy season. Some of the plants already are in full operation and others are only waiting to secure sufficient help before starting. What little brick are available from last year's stocks are selling at $12, new brick being quoted at $9.

DISTRICT OF COLUMBIA

Washington (D. C.) brickmakers are interested in the new apartment house to be erected at that point by Kennedy Brothers, which will require more than 1,000,000 face-brick, as well as a large number of common-brick. Kennedy Brothers have not yet decided whether the exterior trim will be of terra-cotta or limestone. When completed, the structure will be one of the largest apartment houses in Washington.

GEORGIA

Under the leadership of the Georgia Shippers' Association, Georgia brickmakers and dealers, together with other shippers, have planned a state-wide campaign against the proposed revision of intrastate freight rates.

IDAHO

The Idaho Fire Brick Company, located at Troy, has enlarged its capacity due to a constantly increasing demand for its product. The company is at present excavating for two more kilns, each to have a capacity of 140,000 fire-

You can get a higher price for your brick if you guarantee it will be

Scum-Proof

And you can do this with perfect safety by using

R. H. Precipitated Carbonate of Barytes

It neutralizes the salt in your clay so that it cannot appear on the surface of the brick after it gets wet.

But don't accept a substitute—insist on R. H. —**the dependable brand.**

Write for circular and prices.

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We carry a complete line of high grade chemicals for the clay industry

Any man on your plant—no matter how little he knows about machinery—can operate with ease the

Dewey 5-Ton Locomotive

It is so simple in construction—so easy to handle—so hard for it to get out of order, that you don't need a regular locomotive engineer.
Also, the Dewey is light on fuel and strong on grades—the ideal type for the clay plant.
Send for photos and full details.

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¶No matter what your experience has been—or what you think of any other pulverizer—you can easily convince yourself that the

K-B PULVERIZER

will pulverize the hardest kind of shale and toughest of clays with ease, and with comparatively low cost of operation.

¶Built entirely of steel and lined throughout with manganese hardened plates, it has the strength to endure the hardest kind of service.
¶Hammers are adjustable to compensate for wear and to keep the product uniform.
¶The interior is easy to get at—the screens slide out of the lower casing like a drawer.
¶All we ask is an opportunity to prove to you what the K-B will do for you.
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We Are Doing It

Ask Us How—We can make you a saving of 25 to 50% in burning your clay products.
Ask Us How—We can burn your ware with a uniform hardness from top to bottom of kiln.
Ask Us How—We can turn a kiln of hollow ware each week.
Ask Us How—We can vitrify your brick from top to bottom of kiln.
The above results follow the installation of the:

Improved Hook Patent Up and Down Draft System

Can be built in round, or rectangular kilns, old or new, at a moderate expense.
For the above information address

OHIO KILN COMPANY Vigo, Ohio

brick. An order for twelve carloads of ware was received recently.

ILLINOIS

Improvements have been made on the plant of the Hamilton (Ill.) Tile and Brick Company that will enable it to operate thruout the year if business conditions warrant.

The Barron Brick Company of Roanoke, Ill., is constructing a new fireproof office building. One of the features of this building is a connection between the heating equipment in the basement and that in the plant, making it possible for the latter to be used in an emergency.

Work has commenced on the erection of the new plant which the Kankakee (Ill.) Brick and Tile Company is now building, to cost in the neighborhood of $90,000. The combined daily capacity of the two plants, when the new one is completed, will be about two hundred and fifty tons of ware.

All of the clayworking plants located at Monmouth, Ill., have begun operations. The No. 2 plant of the Western Stoneware Company, after several months of idleness, during which time a number of improvements were made, and the Monmouth Clay Manufacturing Company, successors to the Monmouth Mining and Manufacturing Company, started to manufacture ware during the early part of April.

From its stock of building brick, amounting to about 7,000,000, the Springfield (Ill.) Paving Brick Company has taken a considerable amount in filling an order for 2,886,000 brick to be used in the construction of a new high school in that city. A special machine has been installed at the company's plant to manufacture a certain type of building block used in facing the ground floors of this building.

INDIANA

The discontinuance of operations at the Bemenderfer Brick Company, Goshen, Ind., formerly owned by George W. Bemenderfer, marks the close of the last clayworking plant in Elkhart county. While the market for brick in this locality is good, yet considerable difficulty was experienced in securing labor, this being the cause for the shut-down.

New Albany, Ind., has referred a question as to whether certain sections of Market street shall be paved with brick or with macadam to interested property owners. This is a reconstruction job, the city engineer having worked out the estimates which indicate that the cost of the brick pavement would be $4.04 a front foot, which is thirty-four cents more than the cost of macadam. The property owners prefer brick, altho the question of first cost is causing considerable discussion.

Inmates of the Indiana Reformatory at Jeffersonville, Ind., have begun the construction of the new school building which was authorized by the 1913 legislature in a round about manner. Instead of appropriating money for the building, the legislature authorized an expenditure for constructing a brick plant and machinery. With this plant the inmates of the reformatory under expert direction will make the brick which will be used in the new building. This structure will also be built by prison labor. The state has saved money by this means, it is said, altho local brick manufacturers have hardly been delighted by the means used.

IOWA

Articles of incorporation were filed recently by the Glendon (Ia.) Brick and Tile Company.

The Postville (Ia.) Clay Products Company has increased its capital stock to $150,000.

KANSAS

All the property and assets of the Kanopolis (Kan.) Clay Products Company were sold recently to George Borell of Wilson, Kan., for the sum of $8,500. The plant will soon be put in operation under his management.

KENTUCKY

George Fiedler, general manager of the Coral Ridge Clay Products Company, Louisville, Ky., reports that the company is operating its plant steadily, with an outlook which he describes as being exceedingly good.

The Hillenbrand Brick Manufacturing Company, which has been operating in Louisville for thirty years, has filed articles of incorporation, giving a capital stock of $12,000. For the immediate future no extension of the plant is planned, altho later this is to be undertaken. Andrew P. Hillenbrand is president of the incorporated concern, Oscar Hillenbrand. secretary and treasurer, and Carl Hillenbrand, vice-president and general manager. Oscar Hillenbrand reports that the company is exceedingly busy and that it is operating to capacity.

The Kleymeyer-Klutey Brick and Tile Works, Louisville, Ky., which has been shut down for a part of the winter, has resumed operations at both its Corydon and Zion road plants. Sixty people are employed by the company which was established forty-five years ago and which has operated successfully from the beginning. H. Kleymeyer is president; F. Klutey, vice-president; F. C. Klutey. secretary and treasurer, and H. W. Klutey superintendent. The company manufactures several sizes of drain-tile and brick.

A matter of general interest to brick and clay products manufacturers of Kentucky is the workmen's compensation law. Many brick manufacturers were present at a conference on April 25 held at the Seelbach Hotel in Louisville, when the members of the state commission named to administer the law, met with representatives of employing concerns. Here the terms of the law were gone over thoroly and the members of the commission answered many of the questions which were asked by the employers. The law becomes effective on August 1. It prescribes rates of compensation but does not create a state fund, leaving the matter of insurance to the commercial and mutual companies.

A large number of Kentucky brick manufacturers are affected directly, or indirectly, by the embargo which the Louisville and Nashville Railroad has put on shipments of all kinds originating on its lines when destined for points east of the Buffalo-Pittsburgh-Huntington line. The Illinois Central Railroad has a similar regulation in effect. The reason assigned by the Louisville and Nashville is, that already the congestion of freight in the East has tied up more than a due proportion of its cars in that section and, unless some restriction is placed, the railroad will be very much handicapped in taking care of the business on its own lines. Some of the Kentucky clay products concerns have been shipping east, but the majority of plants will not be greatly handicapped.

Building operations in Louisville (Ky.) are somewhat delayed at this date, altho there are reports current predicting some rather extensive operations to be undertaken shortly. The Speed estate has announced its plans for completion of the building program begun on Fourth and Guthrie streets. East of the first wing of that build-

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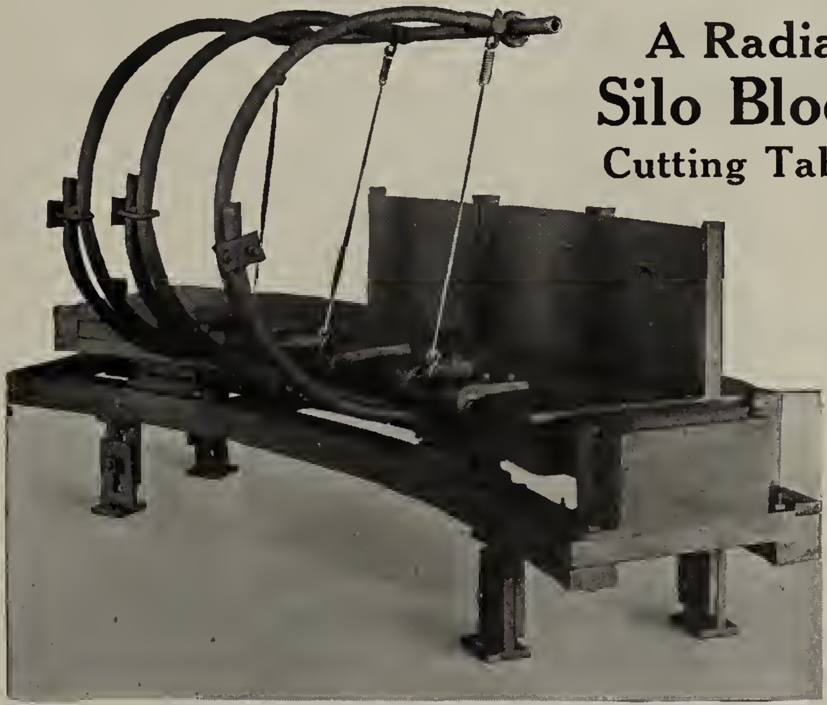

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The Farmers Will Build Hollow Clay Tile Silos

Are you prepared to manufacture—silo block—cheaply?

Get in touch with us and find out about this modern cutter.

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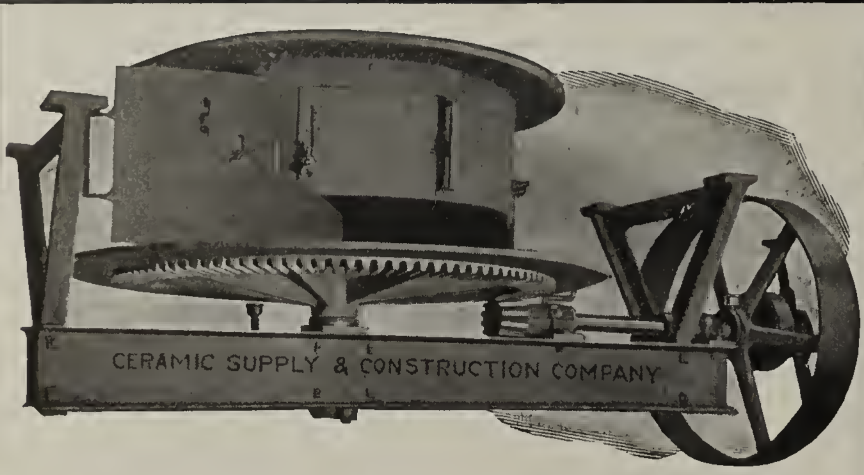

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Crushed Clay to Dry Pans *and* Pulverized Clay to Pug Mills

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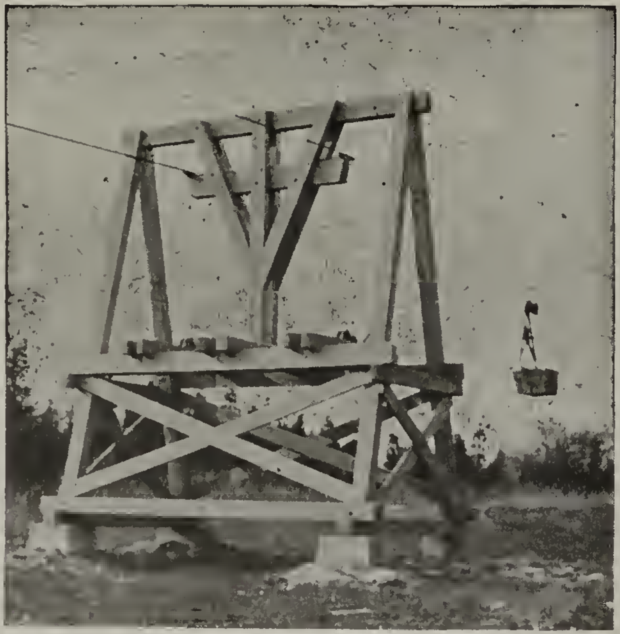

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requires only one man to operate it, will work regardless of bad weather, any capacity desired. It is perfect in construction, simple to operate, maintenance cost is low. Outline your haulage conditions and we will gladly estimate the cost and possible savings to you.

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New York ST. LOUIS, MO. Seattle

ing a central wing will be erected, while the first structure will be duplicated at the corner of Third and Guthrie streets. The whole will be finished in terra-cotta. The Pendennis and the Tavern Clubs will probably erect a new building. The Auditorium Association has reduced the number of prospective sites to five and will make a selection in the near future.

MARYLAND

At the annual meeting of the Savage Mountain Fire Brick Company of Frostburg, Md., the following officers were re-elected for the coming year: Charles C. Gorseuch, president; John A. Caldwell, vice-president and treasurer and W. F. Caldwell, secretary. The past year has been an unusually successful one for the company and it is now far behind in deliveries on orders.

MASSACHUSETTS

The Chauncey Thomas Brick Company was recently incorporated at Boston, Mass.

The New England Brick Company is making preparations for the opening of its plant at Cambridge, Mass., probably early in May. During the past winter several large new sheds and a dryer have been erected, and a new boiler installed.

The Stiles and Hart Brick Company of Taunton, Mass., is running to capacity, making a number of heavy shipments on several large orders. While the preceding year established a record for the number of brick sold for local purposes, this year promises to bring even larger sales in the vicinity of the plant.

Plans are now being made by the Westfield (Mass.) Clay Products Company for the immediate construction of new buildings and the remodeling of the plant which was formerly owned by the Westfield Brick Company. Some of the improvements were started last year by the old company but were not completed. President Darwin L. Gillett stated rerecently that he believes the work will be finished by the early part of June and that the plant will then be operating at maximum capacity, turning out 125,000 brick a day. A new and improved method of making brick will be used and a high grade product manufactured, the company intending to make other clay products later. The plant will be so equipped that it will be possible to continue the manufacture of brick the year around, instead of only in the summer months.

MICHIGAN

The North Star (Mich.) Tile Company has been incorporated with a capital stock of $10,000. Of this amount $5,900 has been subscribed and paid in cash.

The Silica Brick Company of Detroit, Mich., has been incorporated with a capital stock of $60,000 to manufacture firebrick. The stockholders in the new concern are H. W. Alport, N. H. McFadden and W. T. Lego.

The Flint Tile and Fireplace Company has recently located at Flint, Mich., and will specialize in tile floors, wainscoting, mantles, grates and fireplaces. The officers of the company are D. J. D'eath and P. O. Hoenke.

The Standard Builders Supply Company of Grand Rapids, Mich., recently received an order for 1,000,000 brick to be used in the construction of the new Calvin college, to be built in that city.

The Builders' and Traders' Exchange has opened a permanent building exposition in Detroit, Mich., one of the most attractive displays being that of the Detroit Brick Manufacturers' Association, which shows not only the beauty of brick structures, but strengthens the impression made, with an attractive landscape.

The Muskegon (Mich.) Brick and Tile Company has been incorporated with a capital stock of $10,000 to manufacture brick and tile. The stockholders of this concern are Frank E. Handerhaden, William T. Buck and John Mullen.

MISSOURI

George H. Tefft of the International Clay Products Bureau, Kansas City, Mo., is one of two members recently appointed by Mayor Edwards of that city to fill vacancies on the hospital and health board.

MONTANA

The Butte (Mont.) Sewer Pipe and Tile Company has a very good exhibit of sewer-pipe, brick and tile at the San Diego (Cal.) exposition.

With a capital stock of $500,000, the Wagner Fire Brick Company has been incorporated at Helena, Mont., to manufacture fire-brick, and has opened offices at Scranton, Pa., to take care of the sales. The incorporators of this company are Earl V. Wagner, of Scranton, Pa., John C. Wagner of Hamilton, Mont., C. S. Wagner and others.

NEBRASKA

As a result of the failure of a stone pavement, which was laid about ten years ago in Omaha, Neb., to withstand the weather and heavy traffic, several large companies, depending upon this road for short connections to the city, have petitioned for a new highway, which is to be paved with brick.

NEW HAMPSHIRE

Brick manufacturers along the Cocheco and Back rivers in Dover, N. H., and vicinity, are making preparations for the reopening of their plants for the summer season. Weather conditions during the past month have been unfavorable to an early resumption of operations and many plants which had planned to open in April will not do so until the middle of May. Elbridge Gage engaged all of the help for his plant at Dover and the men are now busy clearing up the yard preparatory to starting the actual work of manufacture. Other yards that are soon to be put in operation are those of James Morang, James W. Ford, Pearl and Pinkham and Isaac L. Lucas. All have a large number of orders on hand to be filled.

NEW JERSEY

The Atlantic Brick Manufacturing Company of May's Landing, N. J., reopened recently, employing a force of one hundred men. During four months of idleness the plant has undergone extensive repairs. Large orders have been booked and a record run is anticipated by officials of the company.

NEW YORK

Preparations for the season's run are being made on Hugh Davidson's brick plant, which is located at New Windsor, N. Y. The drying yard is being leveled and the machinery put in operating condition.

Salagona and Company is the name of a new concern that has been incorporated with a capital stock of $15,000 at New York, N. Y., to manufacture ceramic products such as mosaic, enamel and tile work. The incorporators are Adelina L. Salagona, Emilio L. Salagona and Adolph Globbe.

The Champlain Brick Company of Mechanicsville, N. Y., has operated only one brick machine since it rebuilt its plant, which was destroyed by fire two years ago. Recently, however, it began to operate a second unit, returning to its former capacity of 86,000 brick per day.

flex

The arrangement of the Heating System in a drier has much to do with the drier's success with different varieties of clays.

One big feature of The Standard Heating System is its **extreme flexibility of arrangement,** which makes it adaptable for the drying of **all varieties** of clays.

The Standard Heating System can always be arranged to suit the special requirements of any clay, and to meet any steam conditions.

This is an interesting phase of the brick drier proposition—one that it will pay you to consider. We shall be glad to send you complete information.

Write for our catalog, which tells all about The Standard Natural Draft Steam Drier. Address: The Standard Dry Kiln Co., 1540 McCarty St., Indianapolis, Ind.

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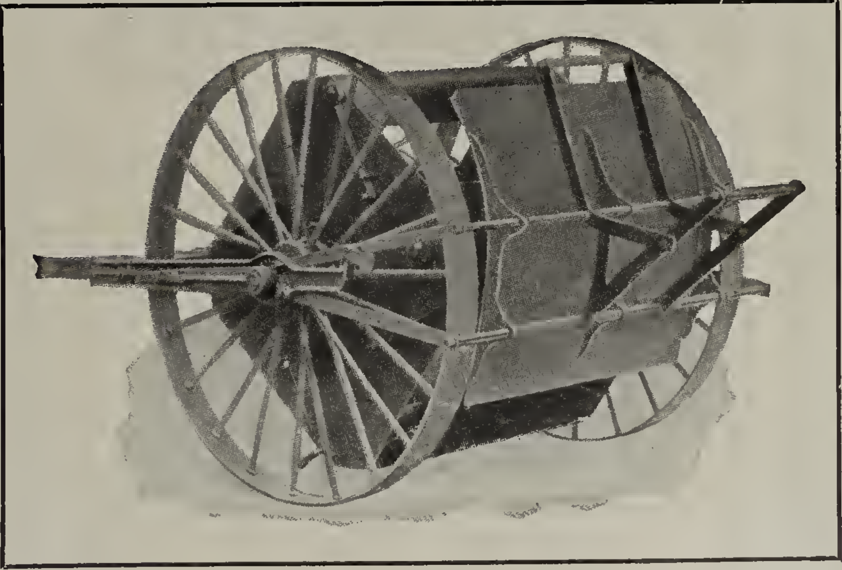
THE QUINCY IMPROVED CLAY and SHALE GATHERER



For gathering clay in the open field, we guarantee that it will save one-half of the cost of doing this work over the usual method of drag or wheel scrapers, wagons and shovelers. They are used in practically every state in the Union. Ask for information now.

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A Big Impressive Instrument

—made so sturdily that it resists rough handling.

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—equipped with a compensating device that compels your serious attention.

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We say it has a conscience—we mean it. We go further—we say it is the best in the world—we can prove it.

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NORTH CAROLINA

The Buffalo-Shoals Clay Manufacturing Company of Statesville, N. C., has applied to the state for a charter, and will incorporate with a capital stock of $25,000. The company's plant will be located ten miles west of Statesville, on the Catawba River. While the principal product will be face-brick, hollow-tile and other clay products will be manufactured. The company has recently purchased, for the sum of $30,000, a three hundred and sixty-five-acre farm, which contains a fifty-acre deposit of clay. Those interested in the company are E. R. Rankin, E. G. Gaither, F. F. Steele and others. Mr. Rankin, it is understood, is to be secretary and treasurer of the new company, and will be in charge of the plant.

NORTH DAKOTA

A heated competition, with the acquisition of a large electric porcelain plant as the prize, is being staged by the cities of Dickinson and Hebron, N. D. The new concern will locate where the best clay deposit is available and where shipping facilities are the most desirable. Both cities claim the superiority in these features. The proposed plant is to be erected by the General Electric Company of Schenectady, N. Y.

OHIO

William Brungartner, general manager of the Junction City (Ohio) Sewer Pipe Company, was in Columbus recently looking after his fuel supply for the coming season.

The Standard Mosaic and Tile Company has been incorporated at Cincinnati, Ohio, with a capital stock of $10,000, by John M. Mueller and others.

After serving for nine years as vice-president and general manager of the Warren B. Ferris Brick Company, Columbus, Ohio, Robert E. Kelley has resigned that position to enter the real estate business.

Stoneware pottery manufacturers in the Zanesville (Ohio) district have sent notices to the trade of an increase in the price of this line of ware. An advance in the cost of raw materials is given as the cause for this action.

The Brick Homes Company has been incorporated in Cleveland, Ohio, with a capital stock of $25,000 for the purpose of extending the use of brick as a building material and for dealing in burned clay products generally.

At a recent meeting of the Ohio Paving Brick Manufacturers' Association, held at Columbus, W. N. Alderman, of Athens, was elected president for the ensuing year; F. L. Manning, of Portsmouth, vice-president, and Charles J. Deckman, of Cleveland, treasurer.

The Lima (Ohio) Automobile Club has gone definitely on record as favoring brick paving for the improvement of highways. A special committee was named recently to ask the commissioners of Allen county to make improvements with brick in the future.

Car shortage is having its effect on the brick business at this time, according to Columbus (Ohio) manufacturers and shippers. There is a shortage of cars in many localities and consequently shipments have been delayed. Shippers are cooperating with railroad officials to relieve the situation.

The Defiance (Ohio) Clay Products Company, has been incorporated with a capital stock of $25,000 to manufacture brick and tile. The incorporators are: Christ Diehl, Jr., William Bergin, O. M. Small, C. M. Small and Albert F. Diehl.

The Ironclay Brick Company, which has general offices in the Ruggery building, Columbus, Ohio, is making extensive improvements and changes in its exhibit rooms. W. D. Brickell is president of the company, and J. M. Adams, secretary and general manager.

In spite of a campaign waged by some interests against the use of brick in paving Salem avenue, Dayton, the city authorities, including the engineering department, have found that brick would be the most satisfactory material for use on that thorofare, under the circumstances, and recommended brick accordingly.

The offices of the Nelsonville Brick Company, which had been located in rooms 67 and 68 Ruggery building, Columbus, Ohio, for about fifteen years, have been moved to the Wyandotte Building on West Broad street. Charles A. Frank is salesmanager of the concern, which manufactures and markets paving-brick.

The various building supply lines which have been handled for the past six months by the Reliance Coal and Coke Company, Cincinnati, have been taken over by the Moores-Coney Company. An arrangement has been made, however, under which the Reliance company handles the hauling and river work for Moores-Coney, as in the past.

A significant report from Columbus, Ohio, is to the effect that out of six paving contracts for city streets let recently, five specified brick. Columbus has had considerable experience with paving materials of all kinds, including brick, and the authorities, it seems, feel warranted in giving the preference to burned clay in a majority of cases.

So successful was the river outing given last fall to those interested in building by the Cincinnati (Ohio) Brick Club, which includes in its membership nearly all of the leading brick dealers of the city, that the club has decided to give similar affairs at least semi-annually. A committee has already been appointed to make arrangements for a spring outing at an early date.

At the annual meeting of the Ohio Face Brick Manufacturers' Association held at the Chittenden Hotel, Columbus, several weeks ago, F. A. Hoiles of Alliance, Ohio, was re-elected president and J. B. Cooper of Columbus was elected secretary. All of the members reported improved business conditions and a brighter outlook for the future. Mr. Cooper, who is an officer of the Columbus Brick and Terra Cotta Company, succeeds as secretary, C. C. Walters of the Hocking Valley Products Company.

Brick manufacturers, especially those making paving-brick, have joined with city and county officials and good roads enthusiasts towards having the Smith one per cent. tax law in Ohio repealed. The law prohibits the taxation of property above one per ecnt. for all purposes, excepting in certain emergency cases. This law will prevent much road and street improvement which has been desired, and it may be that the law will be repealed at the coming session of the Ohio General Assembly.

About two hundred and twenty-six acres of land have been purchased and four acres leased by Dr. E. A. Woolf and Theodore Lanning, at Dennison, Ohio, to be used as the site for a large sewer-pipe and brick plant to be operated under the name of the Woolf-Lanning Clay Products Company. Fourteen kilns will be built and the main building, which will measure one hundred and twelve feet by two hundred and fifty-six feet, will be constructed along modern lines.

The property of the Shawnee (Ohio) Flash Brick Company, will be sold at a receivers sale May 6, in accordance with an

Three Letters About Three Belts

IN 1909 we received this letter:
"We are operating 3 Gandy Belts on our main drives. One belt 30 inches wide and one 27 inches wide has been running for 14 years. One belt 30 inches wide has been running for 20 years. We are pleased to state that all of these belts are doing good work."
W. J. Dickey & Sons, Inc.,
Oella Mills, Baltimore, Md.

In 1912 this letter came to us: "The three Gandy Belts about which we wrote in our letter of July 22, 1909, are still running, and are still doing satisfactory work."
W. J. Dickey & Sons, Inc.,
Oella Mills, Baltimore, Md.

In December, 1915, came another report: "We are glad to state that the three Gandy Belts mentioned in our letter of March 25, 1912, are still running and prove satisfactory."

These reports—six years apart—on Gandy Belts, which had originally been running 14 and 20 years at the time the first was written.

If this is the sort of belt service you would like, decide now to specify Gandy, the original stitched cotton duck belting next time you order, and be sure to get *the* Gandy. Look for the Gandy trade mark.

Write for samples and prices.

The Gandy Belting Company
732 West Pratt Street
Baltimore, Md.
New York Branch—36 Warren Street

GANDY

SAY "I SAW IT IN BRICK AND CLAY RECORD"

Everybody wants in on a **GOOD THING** as soon as it is

A PROVEN SUCCESS

A few years ago in this section of Ohio, **ONE COMPANY** installed our system—today **SIXTY-FIVE COMPANIES** have installed and have our Hook kilns in successful operation.

Isn't this proof enough that Hook kilns are efficient TIME and FUEL SAVERS?

The JUDGMENT of these companies is that "Hook Kilns are Good." YOU can reduce YOUR MANUFACTURING COSTS by taking advantage of this OPPORTUNITY.

JOIN THE RANKS OF LOW-BURNING-COST PRODUCERS. WRITE TO US NOW.

Hook Patent Kiln Co.

VIGO, OHIO

Canadian Office:
250 DUFFERIN STREET, TORONTO, ONTARIO

*Hook Kilns are Operated
All Over the Central West*

EFFICIENCY DURABILITY ECONOMY

order issued by the court. Samuel D. Doney has been named receiver. The property which consists of a modern brick plant is appraised at $73,532. The rights included are fifty-three acres of land on which the plant is located and the ownership of the clay rights on adjoining tracts of 180 and 167 acres. The sale will take place at the court house in Franklin county.

The activity in the clayworking industry just now, resulting from the best building prospects in several seasons, has left open a position ordinarily considered desirable, but which is now almost going begging—that of superintendent of the Ohio State brick plant, which pays $3,000 a year. The position is to be filled from successful applicants passing a civil service examination to be held on May 17. The state is hoping that a number of practical men, able to pass the examination, will present themselves in order to furnish some eligibles from which to select the superintendent.

Pursell-Grand Company, Cincinnati, Ohio, reports excellent prospects for a good business this season, the fact that it has increased its sales force to five men indicating considerable faith in the outlook. The company has started deliveries on its contract to furnish 400,000 salt-glazed brick for interior work on the new Hamilton county courthouse, that structure having progressed very rapidly to a point where the material will be needed shortly. The company also has the contract recently awarded, to furnish Belden brick for the inside walls of the new Norwood school.

Special size face-brick will be used by the Cleveland (Ohio) Telephone Company for its new building which will house the Fairmont Exchange in that city. The brick will be supplied by the Hydraulic-Press Brick Company, and will be sixteen and three-quarters inches long. This special size is expected to make the Fairmont Exchange one of the most beautiful buildings in the city. About 50,000 brick will be used in its construction. The Cleveland Telephone Company is said to be considering the exclusive use of this brick in all its new buildings from now on.

The Williamsburg (Ohio) Brick Company is the name of a new concern which will operate the hollow-brick plant formerly owned by the Williamsburg Brick and Tile Company, according to W. H. Willis, of the Shorey-Willis Brick and Supply Company, Cincinnati. This company has become interested in the Williamsburg plant, together with H. A. Bayless, and has organized a new corporation to handle it and market its output of about 25,000 brick a day. The capacity will be increased as soon as possible, as the Shorey-Willis Company reports that its common-brick output is oversold on account of the extremely active demand now existing for this grade of brick.

Ohio authorities are rather disappointed, it is understood, because of their inability to dispose of about a million and a half paving-brick made at the Junction City plant by prison labor. State Highway Commissioner Cowen is authority for the statement that contractors taking highway paving jobs refuse to consent to an arrangement whereby State brick will be used, insisting on making their own arrangements for material. Under a recent opinion of the attorney general, these brick cannot be disposed of in the open market unless stamped "Prison Made," and those manufactured in the future will be so marked. This, however, does not aid in disposing of the large supply of "pavers" on hand, and unless they can be disposed of in some way, bid fair to remain on the yard indefinitely.

The flourishing state of business for Cleveland (Ohio) clay products manufacturers is not without its drawbacks. During the past month, for instance, it has been necessary to grant an increase in wages to the employes of many of the plants in this district. At the Camp Conduit Company's plant, for example, a fifteen per cent. increase has been effected. The price of coal is also on the jump, according to M. H. Camp, president of the company. This, coupled with the existing car shortage, has made life anything but pleasant for the man who works in clay. "In spite of these conditions," says Mr. Camp, "we are busier than ever. We have completed the contracts for the Statler Hotel Annex and the New Union National Bank." The orders covering these jobs included all of the fireproofing used in these buildings.

An unusually late spring has retarded building operations in and around Cincinnati, Ohio, but now that the weather seems to be more favorable, prospects are bright for the most active year in the building trades for many a season. The large jobs under way or projected alone guarantee that big contracts will be plentiful, while it is probable that there never was more residence and other small work being planned. The courthouse is progressing nicely, the Hyde Park school is getting ready for the delivery of material, and other big jobs are lining up rapidly. For one, the organization of a company to take over the long vacant corner at Fourth and Walnut and erect a good-sized building, helps materially, especially in view of the fact that the Business Men's Club may accept the offer of a free gift of "air space" above the third floor, and add eight or ten stories for its new home. The R. K. LeBlonde Machine Tool Company is preparing to erect several large buildings at its new plant at Edwards and Madison Roads, while the French Brothers-Bauer Company is also planning a new plant to cost about $200,000. On the whole, therefore, it may readily be seen that there is going to be plenty of opportunity for Cincinnati brick and material dealers to break records this season. The activity in their offices indicates that they will make every effort to attain that desirable end.

PENNSYLVANIA

The Boyer Brick Works, Kutztown, Pa., began operations for the spring and summer about April 15, with a sufficient number of orders on hand to keep the plant busy for some-time to come.

The Cumberland Clay Products Company is the name of a large concern being incorporated with a capital stock of $200,000 at Philadelphia, Pa., for the purpose of manufacturing clay products.

The demand for brick in the vicinity of Chester, Pa., is so great that contractors and builders are experiencing considerable difficulty in obtaining this material for building purposes. This demand has come as a result of extensive operations under way in that city.

The White Star Clay Works of Long Swamp, Pa., of which R. B. Wilson is superintendent, is installing additional machinery to supply the increasing demand for its product. Since the middle of April several employes have been added to the payroll and the plant is now working to capacity with a greatly increased output.

The Kelly-Steck Clay Products Company is the name of a large Philadelphia (Pa.) company which has been incorporated with a capital stock of $100,000, for the purpose of manufacturing clay products. The incorporators of the new concern are William Boyd, W. I. Lofiand and George W. Morgan, the latter being a resident of Dover, Del.

Extensive improvements, estimated to cost $60,000, and

Yard
Transportation
Equipment

KOPPEL

Dryer and Clay Cars, Switches, Turntables and Rails are found in Modern Plants throughout the Country.

THE
"ELECTROMOBILE"
Electrically Driven Industrial Truck

Solves the
"Wheeler" Problem

"Write Our Engineering Dept. for Cost Data."

ORENSTEIN-ARTHUR KOPPEL CO.

PLANT: KOPPEL, PA.

Sales Offices:
New York Chicago San Francisco Pittsburgh

SAY I SAW IT IN BRICK AND CLAY RECORD

CYCLONE BOILER GRATES

Sold on 90 Days' Trial

These are the six points of superiority:

1. Even distribution of draft.

2. No fuel gets into the ash pit.

3. Locks level.

4. Burns cheap fuel.

5. No fingers to burn off.

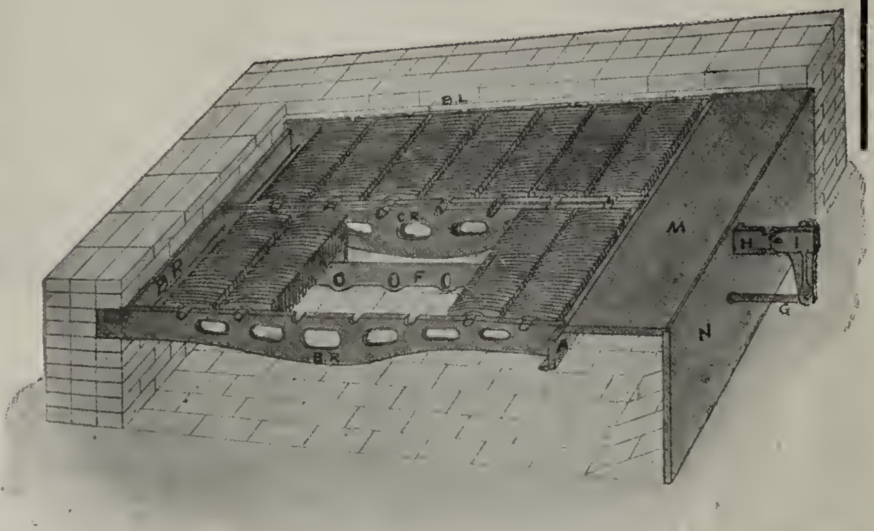
6. Impossible to warp.

In practical everyday service they have proved that these claims are in no manner overstated.

We are enabled to sell on the trial basis because our confidence in the grates is substantial, they do produce more heat at a great deal less cost—and we know it.

Ask us to prove it to you.

Cyclone Grate Bar Co.
Buffalo, N. Y.



SAY "I SAW IT IN BRICK AND CLAY RECORD"

which will materially increase the capacity of the two plants of Hiram Swank's Sons, at Johnstown and Irvona, Pa., are now under way. Three new kilns are being built at the Johnstown plant and four are being added to the original battery at the Irvona establishment, making the total number of kilns on both yards thirty-one. A new side track has also been constructed at the Johnstown plant.

QUEBEC

The Canadian China Clay Company has been incorporated at Montreal, Can., with a capital stock of $1,500,000 to manufacture china clay products. The incorporators of this company are Francis G. Bush, George R. Drennan, Michael J. O'Brein and others.

SOUTH CAROLINA

The officers of the newly incorporated Columbia (S. C.) Clay Company are E. H. Titus, president; Eugene Evans, vice-president, and T. J. Evans, Jr., secretary. These men also constitute the board of directors. The company owns the yard and equipment of the former Granite Brick Company and expects to begin operations immediately, under the direction of A. T. Beatchford as superintendent.

TENNESSEE

W. G. Bush and Company of Nashville, Tenn., is placing a new rough-textured face-brick on the market. It is claimed that the color combinations of this brick are especially attractive.

The plant of the Bristol (Tenn.) Brick Company, which has been idle since last December, recently began operations and hopes to catch up with a number of orders that have been waiting to be filled. The outlook for the season is especially good.

The Lonsdale (Tenn.) Brick and Pottery Company has recently been incorporated with a capital stock of $25,000, to operate a brick and pottery plant at that point. The new concern will take over the plant of the former Lonsdale Brick Company and will ship in clay for the manufacture of brick, tile and pottery from the vicinity of Knoxville, Tenn., the development of the enterprise depending upon the character of the clay. The incorporators of this company are L. D. Morris, A. C. Morris, Henry Hudson, G. Penland and F. W. Flenniken.

TEXAS

The Athens (Tex.) Tile and Silo Company has been incorporated with a capital stock of $1,000 by J. W. Murchison, C. W. Martin and J. F. Neff.

UTAH

As a forerunner to the development of a large bed of fire-clay that was recently discovered about two miles north of Provo, Utah, the Provo Pressed Brick Company, backed by business men of that city, has erected a kiln eighty by thirty feet, in which to burn the fire-brick that are to be made.

WEST VIRGINIA

Altho the plant of the Kenilworth Tile Company, located at Newell, W. Va., near East Liverpool, Ohio, was destroyed by fire only a few days ago, plans for rebuilding are now being made. Claude Nease, general manager of this plant and one of the principal owners, announces that just as soon as the insurance is adjusted, the rebuilding will begin. Much machinery was destroyed by the fire, which started from an explosion of gas in the boiler room. This was the first tile plant to be erected in the upper Ohio Valley and is in the heart of the western pottery district. It has been a success from the start, its capacity being steadily increased by the erection of additional kilns. About two hundred people were employed by the company.

WISCONSIN

Fire recently destroyed the roofs of the kiln shed and driers at the Menomonie (Wis.) plant of the Hydraulic Press Brick Company, causing a loss of about $6,000. For a time the entire plant was endangered by the flames.

Plans are now being considered for a further development of the clay deposits of Menomonie, Wis., which at present are being utilized solely for the manufacture of brick. G. A. Perry of Stillwater, Minn., president of a drain-tile company in Minneapolis, recently addressed the local commercial club on the advisability of erecting a drain-tile plant at Menomonie. This has led to the appointment of a committee to study the plan.

WYOMING

It is reported that the business men's club of Lovell, Wyo., is considering a proposition made to it by Paul Donovan of Broadview, Mont., to construct a clayworking plant at that point to cost $40,000.

Building operations at Riverton, Wyo., are somewhat retarded by an inadequate supply of brick. A good market for this product is reported, the demand thus far not being supplied.

The BURNING *of* PORCELAIN

(*Continued from page* 830.)

liable to occur in the biscuiting of large and heavy pieces of porcelain from which the chemically combined water has not been entirely driven out. In the glost burn this water will retard the diffusion of the reducing gases and the reduction process will be incomplete toward the center of the piece. Often an exchange between the water vapor and the hydrocarbon gases will take place, causing the deposition of carbon which can only be burned out by prolonged heating under oxidizing conditions.

Where coal is employed as a fuel the desirable firing conditions during the reducing period are outlined as follows:

Heavy intermittent firing is not recommended as producing the best results, as with each fresh charge of fuel heavy smoke is produced, owing to the cooling of the fire-box by the coal and the inrush of cold air from the open fire-door. As the fuel bed increases in temperature the quantity of smoke issuing from the stack decreases and finally disappears, the operation being repeated with each fresh charge of fuel. The heat lost by this method of firing is considerable. With the application of heavy charges the fuel bed is cooled and the air fails to combine with the distillation products of the coal, the kiln atmosphere being composed of uncombusted gases and air.

Better results are attained by keeping a hot fuel bed and by frequently applying small fresh charges of fuels, at the same time keeping the draft as low as possible and avoiding the entrance of too much air by keeping the fire-doors and all openings closed as much as possible. Firing in this way, the temperature of the kilns rises

SATISFACTORY COAL SERVICE

Just read the letter

Rutledge & Taylor Coal Co.,
St. Louis, Mo.

Gentlemen: Replying to your inquiry of January 7th with regard to the Rutledge & Taylor Livingston coal. We are pleased to advise that we have used this coal for about four years and find that it is excellently well suited to our purpose.

This coal fires freely, with a long flame and a small amount of clinker and ash.

We also find its effect on the kiln is not so severe as other coals which we have used, and that the service given us by your company is very excellent.

Trusting that this gives you the desired information, we are

Yours very truly,
The Kankakee Tile & Brick Co.,
SDK/FAS By S. D. Knight.

Every single element of service—Rutledge & Taylor Service—is mentioned in that letter—

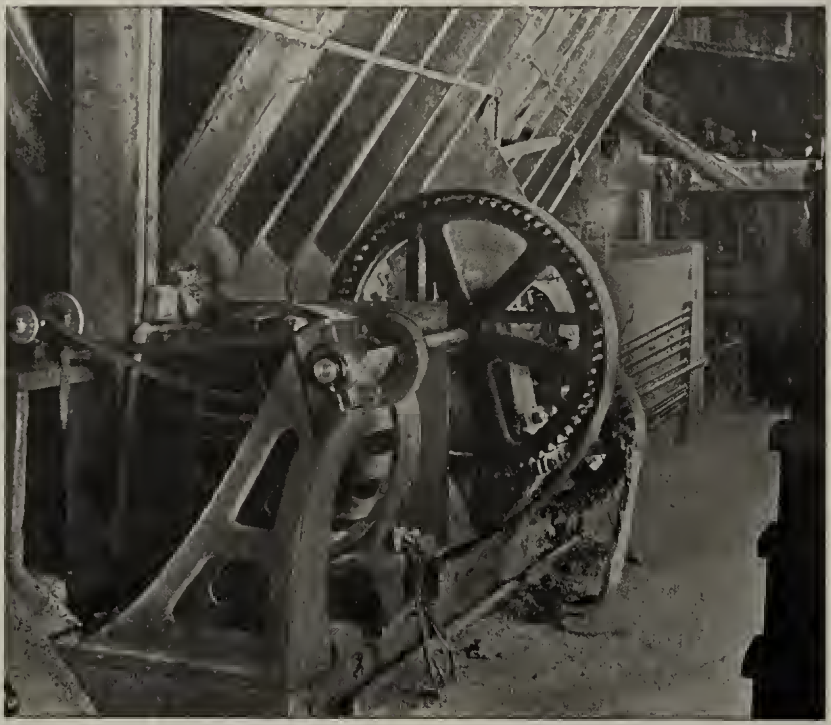
Livingston Coal is excellently well suited—because it fires freely, has a long flame, a small amount of clinker and ash, is not severe on the kiln—and lastly—the service is characterized—EXCELLENT.

NOKOMIS or LIVINGSTON COALS

Shipped everywhere west of Indiana on the Big 4, C. & E. I. and I. C.

Rutledge & Taylor Coal Co.

St. Louis, Mo. Chicago, Ill.



Too Many Clay Workers Neglect Power Cost

If you are driving this machine with a 50 horsepower motor and using cast tooth gears, your power for three hundred ten-hour days costs you $600.00.

If you will use cut gears, the saving will be from $150.00 to $240.00—enough to buy all the gears you will use in ten years.

Ask Your Own Mechanical Engineer

NUTTALL—PITTSBURGH

rapidly and a great saving of fuel is gained over the method of firing heavier charges at longer intervals.

Obviously, by the employment of a reducing atmosphere in the burning, the quantity of fuel necessary to reach a given temperature is much less than in burning under oxidizing conditions with a large excess of air.

As stated before, the best practice appears to be to endeavor to have about five per cent. of carbon monoxide and hydrogen in the kiln gases, avoiding the production of black smoke. A carbon monoxide and hydrogen content of from three to five per cent. is satisfactory and favorable to the production of ware reduced to the desired extent.

The finish of the reducing period may be formed to correspond to the softening point of cone 8 or 9, or the point at which the melting of the fluxing materials has proceeded to a considerable extent. This point would of course vary somewhat with the composition and refractoriness of the material being burned.

FINISHING PERIOD

With the rise in temperature the pores of the ware gradually close and the glaze softens. Further strong reduction is liable to cause contamination of the body and of the glaze by the deposition of carbon, which cannot be burned out. Theoretically, a neutral fire neither oxidizing nor reducing is most suitable to the ware at this stage of the burning. Practically a neutral atmosphere is maintained with difficulty. An excess of oxygen is apt to cause difficulty at this stage of the burning, and it is preferable to maintain a weakly reducing condition. An excess of one per cent. carbon monoxide, the quantity varying between zero and this amount, is not injurious in the production of a porcelain of the requisite cleanliness and whiteness of both the body and of the glaze.

The temperature at which the burning may be stopped is, of course, governed by the chemical and physical constitution of the body and of the glaze. The use of glazed draw trials, drawn at intervals toward the completion of the burning, is of assistance in determining the point at which the burning is completed.

In the burning of porcelains decorated with overglaze or underglaze colors containing reducible metal oxides, the reducing period should be followed by an oxidation period of sufficient length to allow the re-oxidation of the coloring oxides. In this case a slight excess of air should be admitted to the kiln earlier in the reducing period in order that the reduced oxides may be oxidized. It is important to know the quantity of excess oxygen present in the kiln at the beginning of the sintering of the glaze in order to afford the reducible oxides proper time in which to oxidize. An excess of one per cent. of oxygen is ample for this purpose. In the burning of underglaze colors after the glaze has become impervious thru melting, the kiln atmosphere may again be maintained in a neutral or slightly reducing condition.

Summarizing, we may say that on account of the presence of greater or smaller quantities of ferric oxide in all porcelain bodies and glazes in the raw state it is highly improbable that a clear, white, hard porcelain may be produced without the employment of a reducing atmosphere in the kiln during certain stages of the burning. The European process may be condensed as follows:

1. The ware is biscuited to a low temperature—about Seger cone 09, the oxidizing conditions being maintained thruout the burning.
2. The glost burning is divided into three periods, the

heating-up, the reducing, and the finishing periods.

3. Oxidizing conditions are maintained during the heating-up period, which extends from the beginning of the burn to the softening of cone 09.

4. The reducing period extends from cone 09 to cone 8 or 9, the latter point depending somewhat upon the constitution of the body and of the glaze; during the reducing period, carbon monoxide and hydrogen should be present in the kiln gases in quantities from three to five per cent., reducing conditions accompanied by heavy black smoke should be avoided.

5. The finishing period extends from the softening point of cone 8 or 9 to the completion of the burn.

LABORATORY EXPERIMENTS

As stated elsewhere, a clean, white color was not produced in the laboratory by firing porcelain test pieces to cone 13, maintaining oxidizing conditions thruout the burn. Altho the pieces attained a satisfactory translucency, the color was unsatisfactory, being of a yellow cast. However, following the European practice of maintaining reducing conditions during various stages of the burning, further burns produced ware which was very greatly improved as to color.

The test pieces were burned in a down-draft kiln fired with natural gas and compressed air. Oxidizing conditions were maintained from the beginning of the burn until a temperature of 850° C. was reached. At this point the air supply to the burners was reduced, the draft was lessened, and strongly reducing conditions prevailed in the kiln until 1,100° C. was reached. At 1,100° C. more air was admitted to the burners, altho slight reducing conditions prevailed until the finish of the burn about 1,325° C. After the kiln had been soaked for the desired length of time, the gas and air were shut off and the kiln allowed to cool under oxidizing conditions. Several burns were made under the above conditions, and a good white color was produced in every instance.

No difficulty was encountered in maintaining reducing conditions with the natural gas. If the percentage of reducing gases is too great, however, the temperature of the kiln will be lowered. Obviously, the difficulty is overcome by admitting a slightly greater quantity of air to the burners.

As stated before, the presence of particles of iron introduced into the body by iron-bearing minerals or from other sources is made more pronounced when reducing conditions are employed during the burning.

WHITEWARE

Preliminary experiments leading to the improvement of the color of whiteware or white bodies whose water absorption is four per cent. or higher were not conclusive. Unfortunately, the body employed contained some particles of iron which were more pronounced in the body which had been reduced previous to the application of the glaze. The general appearance of the test pieces which were reduced, however, was whiter than those which had been burned under oxidizing conditions.

Obviously, if the reduction process is to be employed in the production of whiteware, the reduction must be carried out in the biscuit burn only, as reducing conditions during the glost burn would tend to cause reduction of the lead and other metallic oxides in the glaze. The preliminary work having given some promise, further work is being done along this line. The problem involves the burning of the biscuit under reducing conditions to four per cent. absorption or greater.

Genasco
Expansion
Joints

Have all the advantages of other prepared joints for brick and block pavements—**economy, ease of installation, the avoiding of melting and pouring**—and besides this

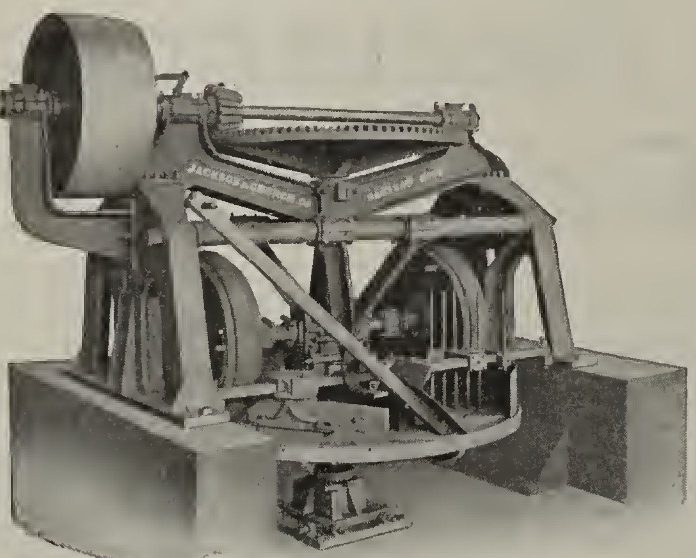
Are All Asphalt

The **entire thickness** of a Genasco joint serves the purposes of expansion and contraction. Ready-made joints that contain felt or some other form of re-enforcement cannot do the work of the Genasco all-asphalt joint. Any thickness or depth.

The best way to judge this joint is to see it. A life-sized sample will be sent to any one interested. Write for it today.

The Barber AsphaltPaving Company
Philadelphia - - - Penna.

SAY I SAW IT IN BRICK AND CLAY RECORD



Grinding Pan

Wet or Dry

Especially rugged and substantial. Nine-foot size weighs 40,000 lbs. Large shafts with bearings close to point of labor. Accessible adjustable step box. Extra heavy mullers and wear plates of hard white iron. All parts interchangeable. Repair parts always in stock and low in price.

Jackson & Church Co.

Saginaw, Mich.

Builders of a complete line of machinery for making Sand-Lime Brick. Boilers, Rotary Dryers and Kilns, etc.

MACHINERY *and* EQUIPMENT

Descriptions of Machinery and Accessories and Detailed Announcements that Our Advertisers Believe will Interest Our Readers

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Why Shaking Grates Can Burn Cheap Fuel

The selection of a grate for economical burning of fuel is certainly an important task, too often neglected.

It is known that the amount of grate surface required per horsepower, and the proper ratio of heating surface to grate surface are extremely variable, depending on the coal and the rate of draft.

With good coal, low in ash, the best results apparently are obtained with strong draft and high rates of combustion—provided the grates are cut down so that the total coal burned per hour is not too great for the capacity of the heating surface to absorb the heat generated.

With poor coals, high in ash, especially if the ash is easily fusible, tending to choke the grates—a large grate surface and a slow rate of combustion is necessary unless means such as shaking grates are provided to get rid of the ash as soon as it is made.

In other words a lower grade coal can be burned economically, effecting a great cash saving, if means are employed to keep the grate spaces clean, thus allowing free draft. Cyclone Boiler Grates provide this means. Without opening the fire doors the grates can be gently shaken at intervals and a perfect fuel bed maintained.

This is an impossibility with the old style, horizontal, stationary type, where it is necessary to open the doors wide and dig in with slash bar and hoe, in order to keep bed from matting. This obviously entails a loss.

There are many others advantages accruing from the use of Cyclone shaking grates. Write to the Cyclone Grate Bar Company, Buffalo, for a complete discussion.

The Importance of Even Feeding

No matter how efficient a clay plant is in its machines, cutters, presses, etc., it can't possibly be run to 100 per cent capacity unless the clay is fed uniformly and in sufficient quantity. In a very large number of plants this is a daily accomplishment because of the use of Steele's Even Feeder made by J. C. Steele and Sons, Statesville, N. C.

This is a multiple shaft machine fitted with a series of special knives so devised that they will not catch roots. The machine runs very slow, giving it long life. It weighs 6,500 pounds—heavy enough to be substantial and strong. The shafts are made to withstand heavy strain, and each knife can be quickly removed for replacement by removing only one bolt. The hopper, into which the clay is dumped, holds two and three-quarter yards, but is arranged for an extension to hold any amount desired.

Steele's Even Feeder has been operated in clay plants for an entire season without one cent repair cost, and it has, in scores of instances, increased capacity 25 per cent. It is also a labor saver because it does away with the labor of two men. It soon pays for itself.

Every clay-products manufacturer ought to know about this money-maker. Just a postal will bring full details.

Bonnot's New Factory

One can always put implicit trust in an individual or company that "takes its own medicine." That's why the Bonnot Company of Canton, Ohio, have been so generally commended and congratulated on the completion of their new building which is the main part of their large, well-equipped factory.

The new building is steel and brick construction, and the sides of the upper portion are of wire glass so that, even on the darkest days, streams of light pour into every corner. This makes it easy for every workman to turn out a quality of work that will stand the closest scrutiny.

This one building measures 95x210 feet, which allows plenty of room for work without interference. All material is handled by a traction electric crane of 25-ton capacity which reduces handling costs to a minimum and is a big time-saver.

The Bonnot Company ship their product into every clayworking section of the country and they have been one of the dominant forces that has made for greater efficiency in clay-products plants. Bonnot machines—dry pans, represses, cutters, pug mills, machines for brick and hollow-ware—have helped to make some of the most efficient and profit-paying plants in the country. In doing for themselves just what they have urged clay products men to do—increase the efficiency of manufacture—they are "taking their own medicine," and thus are able to maintain their reputation for "Quality" machines at prices that are consistently low.

Clay Digging Economy

The scarcity of labor that has prevailed all over the country for the past year has not "passed up" the clay plants—they have been just as hard hit as other industries. In many ways this is proving a blessing because it has forced the installation of labor-saving machinery and equipment, and plant managers now see the practical application of economies they have wished for in the past.

One department that has been especially neglected in the matter of more efficient operation is the pit. It is perhaps safe to say that in the majority of plants the clay is still being dug by the old, laborious, inefficient hand-labor method. The burden of this has naturally become more apparent with the increased scarcity and high price

One End of New Bonnot Factory

"Not in words alone—
But in deeds"

THE
UNDERWOOD PRODUCER GAS BURNING SYSTEM
PATENTED

is in successful operation in several plants and is effectually and profitably burning different kinds of burned clay products.

There isn't any "magic" about the Underwood System—it is simply a practical application of scientifically accepted theories.

Ever since man began to make clay products the big problem has been to reduce burning costs and make a better product.

The Underwood System—which is the application of Producer Gas to periodic kilns—is an accepted successful method because it has proven, in actual every-day practice, that it reduces the fuel and labor cost and makes for a better product because it permits of uniformity in burning.

No matter what you have thought in the past—or what your experience has been—it will be worth your while to at least learn what the Underwood System can do for you.

THE
MANUFACTURERS EQUIPMENT CO.
DAYTON, OHIO U. S. A.

GEO. H. SMITH
Western Representative
510 Reliance Bldg., KANSAS CITY, MO.

Your Last Chance
To Get These Reprints

All but the small number indicated have been sold and the plates destroyed.

No More Will Be Printed

so get your order in now for those you want.

These reprints of timely articles published in former issues of "Brick and Clay Record" make excellent educational and advertising literature

They Will Sell Your Product

Paving Brickmakers—You can use the first five—they have won contracts for others—they will do the same for you! Here is a list of those on hand and the quantity available:

No. 1. "The Truth About the Concrete Roads of Wayne Co."—October 7th, 1913, issue. A 16-page folder, 9x12, in which Paul E. Green, M. E., tells the story of his complete investigation for the tax-payers of Highland Park, Ill., by whom he was sent to get the truth. Profusely illustrated. $2.50 per 100; $12.00 per 500; $20.00 per 1,000.	1200 Left
No. 2. "Creosoted Block a Failure"—November 4th, 1913, issue. Chicago's experiences with wood block graphically told in pictures and type in the form of a 4-page insert at $2.00 per 100; $5.00 per 500; $8.50 per 1,000.	4100 Left
No. 3. "Chicago Concrete Streets a Failure"—March 7th, 1914, issue. A similar story of Chicago's experience with concrete instead of wood block as above, in the same form and at the same price. A valuable piece of literature in concrete road competition. $2.00 per 100; $5.00 per 500; $8.50 per 1,000.	1000 Left
No. 4. "Gov. Glynn (N. Y.) Urges Use of Brick Roads"—April 7th, 1914, issue. An 8-page folder in which Gov. Glynn, of New York, not only gives his views on the exclusive use of brick for the highways of New York, but backs them up with indisputable facts. $4.00 per 100; $15.00 per 500; $20.00 per 1,000.	2000 Left
No. 5. "Economy in Brick Paved Roads"—June 2nd, 1914, issue. An 8-page folder, containing address delivered by Will P. Blair, Secretary of the National Paving Brick Manufacturers' Association, before the First Canadian and International Good Roads Congress, held in Montreal, P. Q., May 18-23, 1914. It is well illustrated with numerous views of brick paved roads; and these pictures are the best answers that can possibly be given the advocates of concrete and other "so-called" permanent pavements. Prices: 100 for $4.00; 500 for $15.00; 1,000 for $20.00.	3000 Left
No. 6. "Safe Factory Construction"—August 1st, 1913, issue. An 8-page folder. Prices: 100 copies for $4.00; 500 for $15.00; 1,000 copies for $20.00.	1000 Left
No. 7. "The Silo—How to Make It Permanent"—October 21st, 1913, issue. An 8-page reprint. Prices: 100 for $4.00; 500 for $15.00; 1,000 for $20.00.	2000 Left

Send Your Order Today to

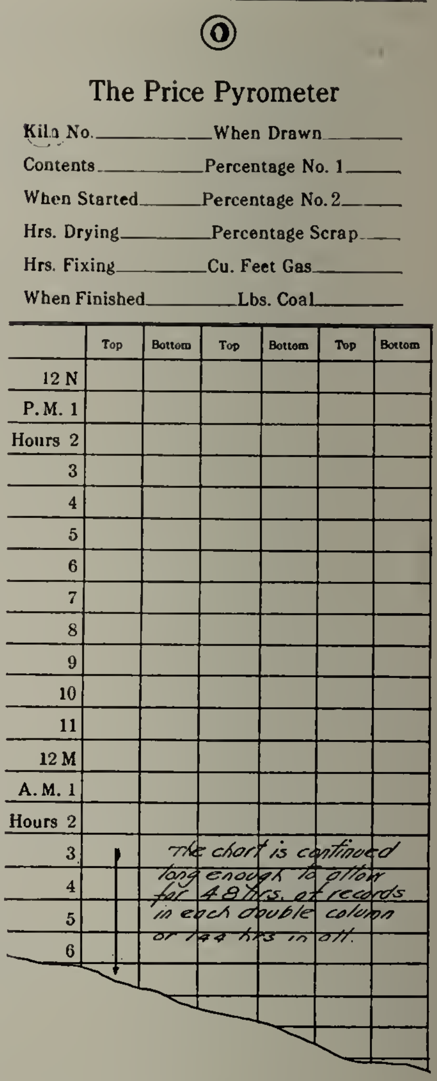
Brick and Clay Record
445 Plymouth Court Chicago

of common labor, and most of these concerns are turning to machine operation.

The Schofield - Burkett Tramway Excavator has proven a great boon to scores of plants because of its simplicity of erection and operation—its low cost of upkeep—its ability to properly mix different clay strata as it comes from the bank. Many of these machines are moving from 200 to 600 cubic yards in 10 hours with only two or three men operating, and with only half a ton of coal for fuel.

Taking average from a large number of practical demonstrations, it has been proven that two or three men can do as much work with the Schofield-Burkett Excavator in the digging and transporting of clay as can be done by 12 to 15 men digging by hand, in the same length of time.

The Schofield - Burkett Construction Company of Macon, Georgia, sell this excavator and erect it, under an absolute guarantee as to specific results. It is well worth your investigation.



The Price Pyrometer

Kiln No.______ When Drawn______
Contents______ Percentage No. 1______
When Started______ Percentage No. 2______
Hrs. Drying______ Percentage Scrap______
Hrs. Fixing______ Cu. Feet Gas______
When Finished______ Lbs. Coal______

	Top	Bottom	Top	Bottom	Top	Bottom
12 N						
P.M. 1						
Hours 2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12 M						
A.M. 1						
Hours 2						
3						
4						
5						
6						

The chart is continued long enough to allow for 48 hrs. of records in each double column or 144 hrs in all.

Pyrometer Card

Pyrometer Cards

The accompanying cut illustrates a card furnished by the Price Electric Company of 12367 Euclid avenue, Cleveland, Ohio.

The card is given to the burner at the time of lighting each kiln and he enters in proper place the various records as indicated.

Pyrometer readings on the indicator are recorded each hour, and from this record it is a simple matter to trans-

Schofield-Burkett Excavator at Plant of Jova Brick Works, Roseton, N. Y.

fer the readings to the proper point on the curve chart, making a graphic picture of the progress of the heat.

Link-Belt Silent Chains

The Link-Belt Company, Chicago, report that the enthusiasm manifested by the different clay men who visited their display at the Brick Convention, Hotel Statler, Cleveland, last February, has resulted in a number of orders for Link-Belt Silent Chain Drives being placed.

The superintendent of one concern in particular, who is motorizing his plant, had, previous to visiting the convention, placed his order for belting. So favorably impressed was he with the smooth-running, flexible, quietly operating drive, and being satisfied that his convictions worked out in practice by getting first-hand reports on the floor from the many different users present, he decided to stock his leather belts for use where chain drive is not applicable, and his plant is now being equipped with Link-Belt Silent Chain Drives.

Over 25 clay plants are equipped with Link-Belt Silent Chain Drives at this time, a fact which clearly indicates the popularity and adaptability of Link-Belt Silent Chain for this severe power transmission service. The success of these drives is rapidly converting brick makers to claim, with the manufacturers, that Link-Belt Silent Chains are the ideal drives for clayworking plants.

Link-Belt engineers have made a close study of power-transmission problems in the various clayworking plants thruout the country, and this together with the patented pin-bushed-joint construction of the chain, a feature found in no other make, are responsible for the great success achieved.

Link-Belt Bulletin No. 91 entitled "The Ideal Drive in Clay-Working Plants" shows many applications of the transmission in clayworking plants. Copies of the booklet can be had upon application to Link-Belt Company.

New Brick Plant for Chicago

The J. B. Tuthill Brick Company has engaged the Trautwein Dryer & Engineering Company as their engineers to construct a modern brick yard of large capacity in the Chicago district.

This yard will be equipped with machinery of special construction, and particular attention will be paid to the economical production of output. This adds another to the already large list of plants which Mr. Trautwein has designed. All the equipment has been purchased and construction has begun.

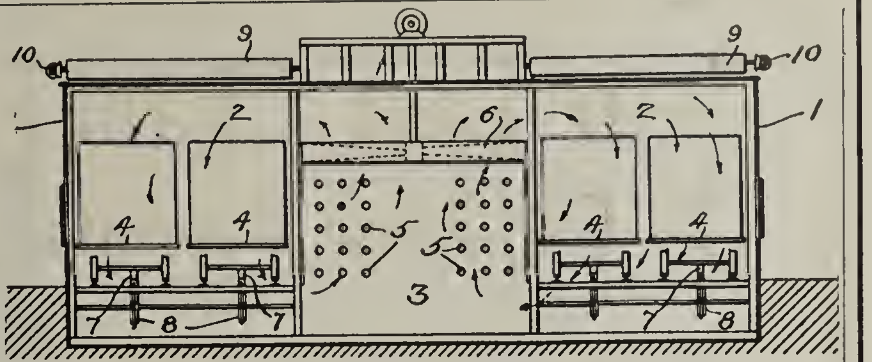
The following letter from D. R. Keedwell, Independence, Mo., indicates better than a whole catalog the worth of Mesaba claims:

"We have been using one of your Taylor Mesaba chains on a 70-ton Bucyrus steam shovel in rock for the past 18 months. Chain has given perfect satisfaction and is good for lots of hard service yet, showing very little wear. Kindly give us information regarding (Missing Links) chain links used in repairing shovel chains of various size. I am a steam shovel engineer."

A request to the S. G. Taylor Chain Company, 138 S. Dearborn St., Chicago, will bring full information.

The A. P. Green Fire Brick Company of Mexico, Mo., who have extensive fire clay beds, have been so rushed with orders that they have had to increase their kiln capacity, and have decided to adopt the Claude Smith Company Steel Shell Kilns.

The A. P. Green Fire Brick Company burns at a very high temperature and the adoption of the Smith kilns was decided upon after careful investigation at other plants. This addition will materially increase their capacity.



Read This—then

Study the above section:

This is a transverse sectional or end view. The steam coils (5) are shown just beneath the fans (6) and the trucks (4) carrying the green ware are on either side, (7) having projections which engage an axle on each truck. These chains pass over wheels (8) which, turned, either by hand or power, the trucks may be moved a predetermined distance.

In another type of the "Proctor" the steam coils (5) are on either side of the trucks (4). This is a better arrangement under certain conditions.

By a simple arrangement of fans the heat waves, which move, naturally, *upwards*, are kept in *active* circulation and, literally like a hot and powerful torrent, are forced to penetrate every nook and crevice in the drying chamber.

By another simple mechanical device the conveying cars pass through this torrent of uniform heat, at a *regulated* pace.

THE

"PROCTOR"

Is simply practical adaptation of well known principles regarding the application of heat to clay and the constant circulation of the heated air.

It is not an experiment—but it has proven its efficiency in every day practice in some of America's finest clay plants.

There's More To Tell About
The "Proctor" Way—Ask Us

Philadelphia Textile Machinery Co.
Philadelphia, U. S. A., Hancock and Somerset Streets

A Quality of Machinery Above All Others.

Results—Not Claims

When a brick manufacturer volunteers the information that his Haigh Continuous Kiln carried him through a panic without loss—and made it possible for him to pay a dividend in those dull times—it ought to convince any one that there is a lot of merit and a lot of possibility in the Haigh Kiln.

We will be glad to send you a letter from this man. Interview him or write him. Look his kiln and product over and decide for yourself whether or not you can duplicate his success. He gives due credit to the Haigh Kiln. It will do as much for you.

The Haigh Kiln saves half of the fuel ordinarily used in burning. It saves half of the kiln labor. It saves the waste heat and besides these savings it insures a better quality of product which gives you a better market.

Particulars for the asking. Five Haigh Kilns sold in the past few weeks. Let us tell you what the Haigh will do for you.

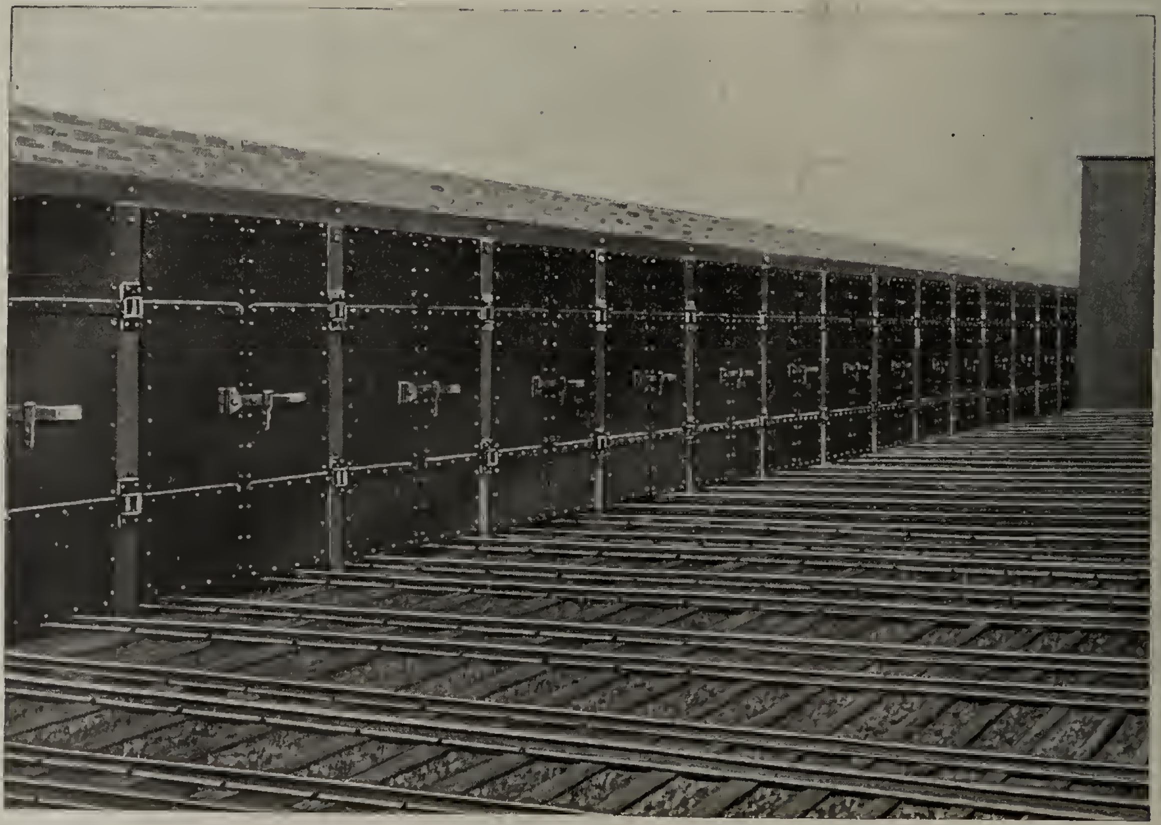
DRYER DOORS

Here is a set of Dryer Doors which show real quality. Our Dryer equipment is the best that can be made.

Our Waste Heat Dryers will save all the waste heat and gases from your cooling kilns.

We have a catalog on this saving feature and will be pleased to go into the matter with you.

Write today.



The American Clay Mchy. Co.
BUCYRUS, OHIO

Builders of Everything Required by the Clay Worker.

SAY I SAW IT IN BRICK AND CLAY RECORD

A 30-Inch Tile Can Be Made On This Heavy Duty Machine—

Every inch of this machine was built for heavy duty. It is not a make-shift, but a specially designed and constructed large-tile machine that was intended for heavy work and does it at the minimum of cost and the maximum of output.

It will make all the extreme sizes up to thirty inches and turn out a perfect product with the least possible waste.

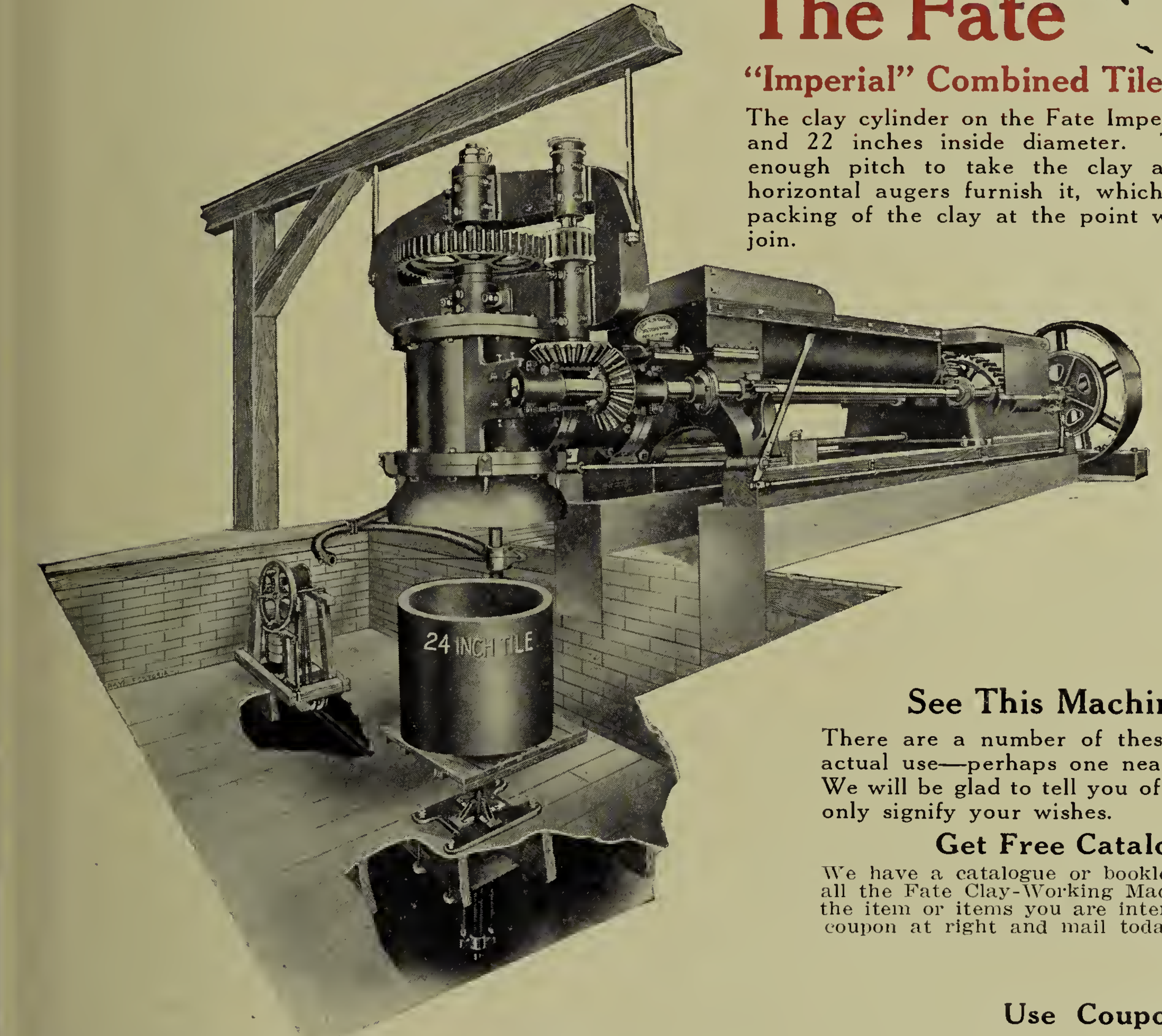
The Wise Man of FATE

The Fate

"Imperial" Combined Tile Machine

The clay cylinder on the Fate Imperial is 22½ inches long and 22 inches inside diameter. The large augers have enough pitch to take the clay a little faster than the horizontal augers furnish it, which prevents clogging and packing of the clay at the point where the two cylinders join.

The cutting arrangement of The Fate Imperial is of the balanced bow sewer pipe press type, easily operated by one man and controlled by a hand-wheel and foot-brake. Two cutting bows are furnished — one for tile up to and including 20-inch and the other up to and including 30-inch.



Note the substantial lines of The Fate Imperial Heavy Duty Combined Machine. The balanced bow cutting arrangement is shown just after having severed the pipe.

See This Machine In Action

There are a number of these big duty machines in actual use—perhaps one near enough to you to see. We will be glad to tell you of the nearest—if you will only signify your wishes.

Get Free Catalogue

We have a catalogue or booklet that describes all the Fate Clay-Working Machines. Check off the item or items you are interested in on coupon at right and mail today.

Use Coupon

The J. D. Fate Co., 240 Riggs Avenue, Plymouth, O. We are interested in the following items and wish you to show us how your Full-Measure Service will benefit us—this request not obligating us in any manner.

☐ Auger Brick Machinery.
☐ Hollow Ware Machinery.
☐ Conveyors. ☐ Pug Mills.
☐ Crushers. ☐ Clay Testing.
☐ Elevators. ☐ Full Equipment.
☐ Clay Feeders. ☐ Industrial Locomotives.
☐ Disintegrators. ☐ Drain Tile Machinery.

Name ....

Town.................................... State..........

J. D. FATE COMPANY

240 Riggs Ave. PLYMOUTH, OHIO

KELLY TRUCKS

EACH Kelly Truck is our promise to pay in ***real*** service. There's some service that's given because it's the custom. There's some service that's given because it was promised. There's some service that tries to be good but lacks organization back of it. But the service that makes a man glad he bought a truck is Kelly Service. This service is as complete, as exact, as willing and as perfectly systematized as the process and plant that make Kelly Trucks.

It is available always and everywhere through our extensive system of factory branches, central service and supply stations.

It is designed to make your truck last to the limit of the endurance of steel, oak and iron; and to give you continuously satisfactory truck service as long as your Kelly Truck lasts.

The Complete Line—1½-2½-3½-4-5 and 6 Tons.

"Like Kelly Does"—FREE

We want to put your name on the free list of this valuable monthly publication devoted to truck transportation (not all Kelly). Full of useful information for all truck users—whatever the motive power.

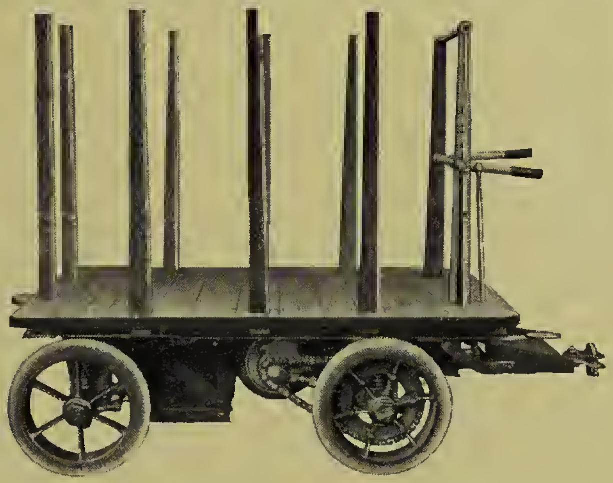
The Kelly-Springfield Motor Truck Co.
1205 Burt Street Springfield, Ohio

Smith Brick Company, Omaha, Neb., uses this 5-ton Kelly Truck with hydraulic hoist steel dump for handling brick.

BRICK and CLAY RECORD

KOPPEL

Electromobile Industrial Trucks



Type "A" Electromobile

displace from 3 to 8 men and stay on the job day in and day out for months.

This continuous service is due to the fact that we have built into the Electromobile Truck those features of design and material which our fory-five years experience have proved to be necessary to stand the gruelling work in clay working plants.

Write for Special Catalog on Electromobile, Carriertrucks, Tractors and Trailers.

Clay and Dryer Cars

Standard and Special Types

Portable Track, Switches, Steel Ties, Turntables, Rails and Complete Industrial Railways.

Write for catalogs on plans and estimates on cost-cutting Transportation equipment for your plant.

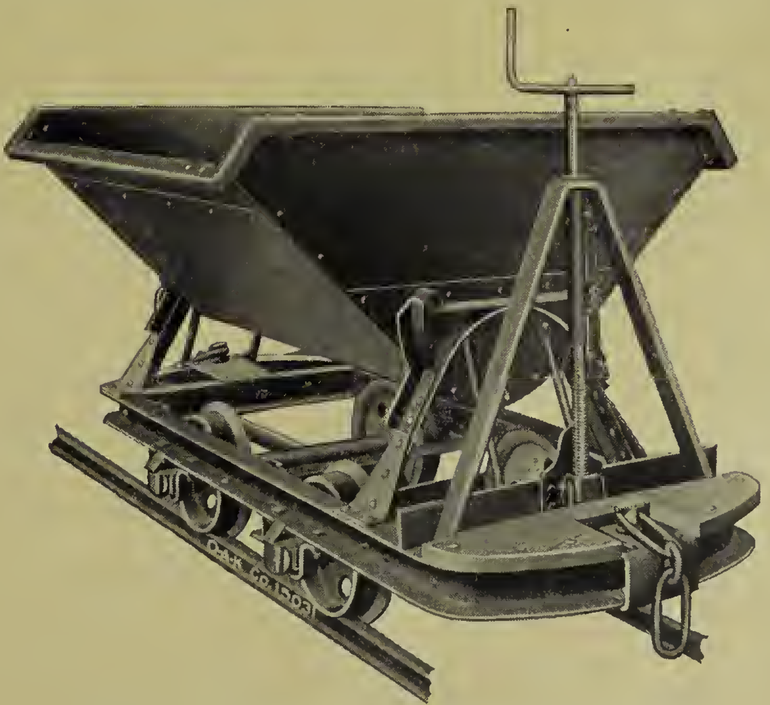
ORENSTEIN-ARTHUR KOPPEL CO.

The "Electromobile"—Electrically Driven Industrial Truck

PLANT: KOPPEL, PA.

U. S. SALES OFFICES New York Chicago Pittsburgh San Francisco

Branches throughout the world



Koppel "New Type" Self-Clearing Dump Car

Vol. XLVIII, No. 10 Chicago May 16, 1916

WELLER-MADE

If there ever was a shortage of labor at a time when every lost minute and every order turned down means good money lost, that can never be recovered—now is the time.

Labor saving devices and equipment, that will cut down the number of men required and allow you to use them at some other part of your plant to speed up and increase your production, are practically worth their weight in gold.

There never before has been such an opportune moment to install apparatus of this character. With the present price of finished products most any of these labor saving devices will practically pay for themselves this year.

Our big, new Machine Shop, where we turn out our Power Transmission Machinery

At the rate that things are going now, and with the shortage in cars, you will be paying anywhere from 15 to 50c a ton to get coal unloaded before next Christmas.

If you have any unloading of coal and distributing either to your boiler rooms or your kilns, we can design you an economical and serviceable coal handling equipment.

If you are having irregular supply of raw clay, or other materials, we can design you a storage and handling system that will take care of over loads and other conditions which keep down your output, and mean many dollars lost each day.

If you have any of these problems to solve you had better write us, and write us quick, because we are getting filled up with orders from other people who are getting there while the getting is good.

We know how to, and do build good

Elevating, Conveying and Power Transmitting Machinery

Weller Manufacturing Co., Chicago

SAY "I SAW IT IN BRICK AND CLAY RECORD"

BRICK *and* CLAY RECORD

Entered as Second Class Matter January 2, 1911, at the Post Office, at Chicago, Ill., Under the Act of March 3, 1879.

Terms of Subscription
One Year—(24 Numbers)
United States......$2.00 Foreign $3.00
Single Copies.......25c

Published the first and third Tuesdays of each month by

Kenfield-Leach Company
445 Plymouth Court Chicago

Chicago, May 16, 1916
Vol. XLVIII No. 10

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The publisher of a business paper should dedicate his best efforts to the cause of Business and Social Service, and to this end should pledge himself: 1. To consider, first, the interests of the subscriber. 2. To subscribe to and work for truth and honesty in all departments. 3. To eliminate, in so far as possible, his personal opinions from his news columns, but to be a leader of thought in his editorial columns, and to make his criticisms constructive. 4. To refuse to publish "puffs," free reading notices or paid "write-ups;" to keep his reading columns independent of advertising considerations, and to measure all news by this standard: "Is it real news?" 5. To decline any advertisement which has a tendency to mislead or which does not conform to business integrity. 6. To solicit subscriptions and advertising solely upon the merits of the publication. 7. To supply advertisers with full information regarding character and extent of circulation, including detailed circulation statements subject to proper and authentic verification. 8. To co-operate with all organizations and individuals engaged in creative advertising work. 9. To avoid unfair competition. 10. To determine what is the highest and largest function of the field which he serves, and then to strive in every legitimate way to promote that function.

The EDITOR'S CORNER

Comment, Criticism and Advice on Live Issues Affecting the Manufacture, Marketing and Manifold Uses of Burned Clay Products

THE word "Preparedness" is getting to be almost as badly worn from much handling as "Efficiency." We see it used countless times in the newspapers which come to us at the breakfast table; we see it in the magazines; and writers of advertisements, taking advantage of the publicity which this word has been given, are using it indiscriminately in copy covering everything from pianos to brass tacks. In truly American fashion we have seized upon this new toy and are playing with it so hard that it is doomed to fall into disfavor as have some of its predecessors which have shone in the lime-light of public attention.

But the tragedy of it all is that very few understand what the word really means, or what its true application is to existing conditions in this country. Speaking in military terms, the popular conception is that it means a huge array of battleships and a gigantic army supplied with plenty of guns and ammunition, which can be ready at a moment's notice to spring up and defend our shores against a foreign invader. Others believe that it does not mean a large standing army nor the tying up of considerable capital in munitions of war, but think rather that it means the preparation of our military resources so as to be available within a very short period, in time of need.

Wise men, however, who remember what Napoleon said about an army traveling upon its "tummy," are looking beyond charging steeds, gold braid and polished buckles and stately generals riding before vast armies. They see that real preparedness does not necessarily mean a vast array of soldiers nor a powerful fleet on the seas, which, without the necessary supplies—not only ammunition and guns—but a thousand other commodities which have no direct relation to warfare—are of little avail. Military strength is nothing in itself, according to present day standards of carrying on a war, unless there are thousands of men, not in the line of march, but in the factories of this country toiling by the sweat of their brows to turn out the necessities for victory both on land and sea.

It is the manufacturer today who is as much a factor in the ultimate success of the country's armies as is the chief-of-staff who can do nothing unless the grimy workers way down in the darkness of the coal mine or the toilers who work in the heat of the blast furnace, do their part.

An example of the misconception of real preparedness is found in our own Secretary of the Navy, Mr. Daniels, who is reported to have said, recently:

"I take the position that the government should be in the position to manufacture every war implement and war munition for two reasons: first, control of and economy of preparation; and second, the elimination of the incentive of the dollar-making individuals to urge the nation to war."

If it is true that the secretary made this statement then there seems to be something radically wrong with his view of looking upon this subject. He apparently forgets that there are many other commodities necessary in modern warfare which are not classed under "war munitions." He forgets the need of bandages, of automobiles, of chemicals, of gasoline, of food and of auxiliary ships. It would seem logical that if the government should undertake the manufacture of munitions and guns that it should also undertake the manufacture of the above-mentioned commodities which are just as necessary as powder, as has been well demonstrated on the European battle fields.

It is needless to go into details regarding the impossibility of such a step. As the "American Machinist" points out, in the event of a real respectable war, we would need one hundred and twenty times our present force of workmen in the government arsenals and one hundred and twenty times our present number of machines, fitted and installed ready for munition manufacture. Yes, more than that—we would need one man sweating in the factory for every soldier and sailor at the front. If we plan an army of a million men, we must also plan another army of a million men to support that million in the field.

Where does the government presume that it can obtain such a working force on a very short notice? These are facts and not fancies and we must look facts in the face if we are to enter into a real campaign for a real preparedness.

Peace and Preparedness

PASSING from the thought of preparedness in the sense of an adequate national defense, and turning to the nation's industries, we see, in a measure, a parallel condition of unpreparedness against the foreign manufacturer. We are constantly hearing rumors of steps that are being taken in the warring countries to prepare for a live campaign of trade extension after peace has been signed. Just how much truth there is in these rumors is not for us to say. It does seem, however, that the home market after the war in these foreign countries, would be such that it could consume all of the products that can be manufactured across the water to replace the enormous damage that has been done. It would hardly seem logical that Europe can compete very strenuously or advantageously with the United States when there is a shortage of skilled workmen on the first mentioned continent and a marked scarcity of capital.

Following along this line of thought, would it not be a good thing if manufacturers of burned clay building materials would look into the possibilities of foreign trade after the war is over. We are thinking just at this time of the invitation which was printed in a recent issue of "Brick and Clay Record" from a representative of the Reconstruction Exhibition which is now being held in Paris, to American clay products manufacturers, asking them to co-operate in sending exhibits to this exhibition with the thought of building up a foreign constituency for these materials.

While the question of ocean freight rates and adequate shipping facilities loom big on the horizon, still it does seem as tho there should be even a limited opportunity for the claywork-er who is prepared to take care of the business, to extend his trade abroad.

There is little doubt but that Europe will rebuild its ruined cities with firepoof materials, just as it has built in the past. It is a foregone conclusion that there will be an excellent market for such materials in the future, and it is only a question of whether the American manufacturer of clay products is prepared to meet the situation or not.

The Suburban Home

"THE countryside magazine"—a well-edited and much-read publication which aims to reach the citizen who loves to get away from the city's noisy streets, its dust and dirt to the quiet countryside to enjoy Nature—contains in its May number a very interesting article by Malcolm Douglas Gordon on "Distinctive Treatment of the Little House Exterior," in which he makes some significant statements regarding materials, showing the trend of building thought to higher ideals, especially in the construction of isolated homes such as are found in suburban communities. After touching upon some generalities concerning the building of a home, Mr. Gordon says:

"Considering building materials purely from the standpoint of durability, there are practical points favoring each of the various structural compositions. There is an ever-increasing appreciation of the merits of hollow-tile for house construction, largely because of its fireproof qualities. To those who have realized the fire menace, even in our best protected suburban towns, and especially in the open countryside, this forms a very important consideration. Brick, stucco, or half-timber over hollow-tile are popular methods of house construction. The all-brick house and the residence of stone also offer this advantage of being proof against destruction, and are favored for this cause.

"But in addition to the fire-consideration, the house of hollow-tile, brick, or stone appeals because of its non-conductive qualities. There is a saying that the stone house is 'warm in winter and cool in summer,' and this pertains likewise to its cousins of brick and hollow-tile. Against rain and wind, also, the masonry house offers a better resistance than does the house of frame; its walls mellow and tone down with the passing of years and the buffeting of inclement weather; and there is not the necessity for repainting or staining and repairing, with their entailed expense, which the frame house must have in order to live.

"What then is the purpose or excuse for the house of frame? First, the difference in original cost; for the price of lumber, even in a day of fast-decreasing forest preserves, is certainly considerably less than the cost of material for the masonry house. Of course, there follows the continual after-cost of upkeep, and the possibility always of entire loss by fire, but the frame-house owner frequently considers the difference worth its risks and the additional costs of caring for his house, once built.

"This is the first consideration in the choice of frame. The second is covered by personal preferences for the wooden house, in one of its many attractive forms, and by the belief of many people that the little house of masonry cannot be adapted so pleasingly to its individual setting.

"The latter, however, is a mistaken belief. There are being built all through this country many delightfully artistic little houses of stucco-over-hollow-tile, of brick, of stone, half-timber, and houses of half-masonry, half-frame, until the prospective small house-builder, who is observant, cannot fail to realize that there are almost unlimited possibilities for graceful adaptations of masonry materials to harmonious combination with the characters of any individual setting."

Mr. Gordon struck pretty close to the heart of facts when he said that some people prefer a frame house to one built of fire-resistant materials, in spite of the danger of fire, the heavy drain upon the purse for repairs that after years will surely bring and the ever-recurring necessity of repainting in order to restore the lost freshness of the wooden structure. Frame houses will continue to be built directly in the face of strong advice to the contrary. That is human nature, and as long as man is in the flesh and wood is available, he will still adhere to the practice of satisfying his fancy.

But Mr. Gordon made a bull's-eye and rang the gong when he said that the excuse for many frame homes is the belief that the small house cannot be made artistic with the use of brick or hollow-tile. There is no doubt but that an inspection of our suburban communities will reveal the fact that burned clay building materials are just as adaptable to the individual setting as is lumber.

While we cannot agree to a compromise with wood in the half-frame house such as Mr. Gordon suggests, because we hardly believe that this sacrifice of fire-resistant qualities and of permanence is justified to satisfy a whim, perhaps, of the owner, yet there is so much wholesome truth in all he has said that we gladly give him the credit for having handed the readers of "The Countryside Magazine" some sound advice in home building.

The sooner the manufacturer of brick, hollow-tile and other burned clay building materials realizes the importance of demonstrating to the architect, builder and owner of the *small suburban home* that his material will not only make a beautiful and artistic dwelling, but one that will last a hundred years, with little or no repairs, with no paint and with the danger of a disastrous fire brought down to the vanishing point, the sooner will he have a stronger market for his products, and with better prices.

WHY "CEDARCROFT" WAS

The Old Home—Built of Wood and Now Fast Crumbling in Decay—Where Mr. Taylor Lived Before He Built "Cedarcroft"

Altho Bayard Taylor—at One Time a Well-Known Author and Lecturer—is Now Dead and Almost Forgotten in the Mad Whirl of This Twentieth Century, Yet the Story of How He Erected His Home of Brick Comes Down to Us with a Wealth of Historic Recollections from the Past.

By H. Winslow Fegley

THAT a poet, traveler and noted newspaper writer should indicate a preference for brick over stone in building his home nearly sixty years ago, is, to say the least, interesting.

Whoever is familiar with the life and works of Bayard Taylor knows about "Cedarcroft," his beautiful home at Kennett Square, Chester county, Pennsylvania. But few know anything of how, when and with what preparation "Cedarcroft" was built, and how well this famous author laid a foundation for a home that is today one of the most visited of literary shrines on the American continent, ranking with those of Whittier, Tennyson, Emerson, Holmes, Longfellow and Wordsworth.

MR. TAYLOR HIS OWN ARCHITECT

When Bayard Taylor built "Cedarcroft," he gave the utmost attention to natural surroundings. He selected a wide lawn, enclosed by woods of oak, chestnut and pine trees. These conditions helped to formulate his building plans and the result was a massive mansion. Mr. Taylor never studied, as he well said fifty-seven years ago, the methods of any architectural school and followed the plans of no particular architect. He did, however, pattern his house after the massive old English country homes and avoided the prevailing architectural fashion in his own immediate neighborhood.

Looking at the home today almost entirely encircled with vines, shrubbery and large trees, one would hardly realize the object that was in the novelist's mind when he let the contract for the erection of the mansion. Then he built to obtain all the sunshine he possibly could and he called it "American sunshine."

Within a few miles of Kennett Square were three excellent varieties of building stone, known as horneblende, limestone and serpentine. All three were excellent for building purposes.

"None better," said Mr. Taylor, referring to the stone, when once asked why he used brick. "But on my own farm there was a bed of the best brick clay, and I found I could save a great deal of money by turning this clay into brick."

It was the nearest material at hand and it meant the saving of labor and cash. Thus Mr. Taylor turned from stone to brick to erect the mansion now so famous in Pennsylvania history.

These brick, when made, were of a dull color, and to give the mansion a more artistic appearance, so he thought, Mr. Taylor used gray granite from a nearby quarry, twelve miles distant. Some time after the mansion was completed, the author admitted that he made two mistakes. First, he paid too much attention to exterior embellishment, fitting the interior accordingly. Then he worked out his own designs, which included the working plans for the mechanics, without even a hint from an architect.

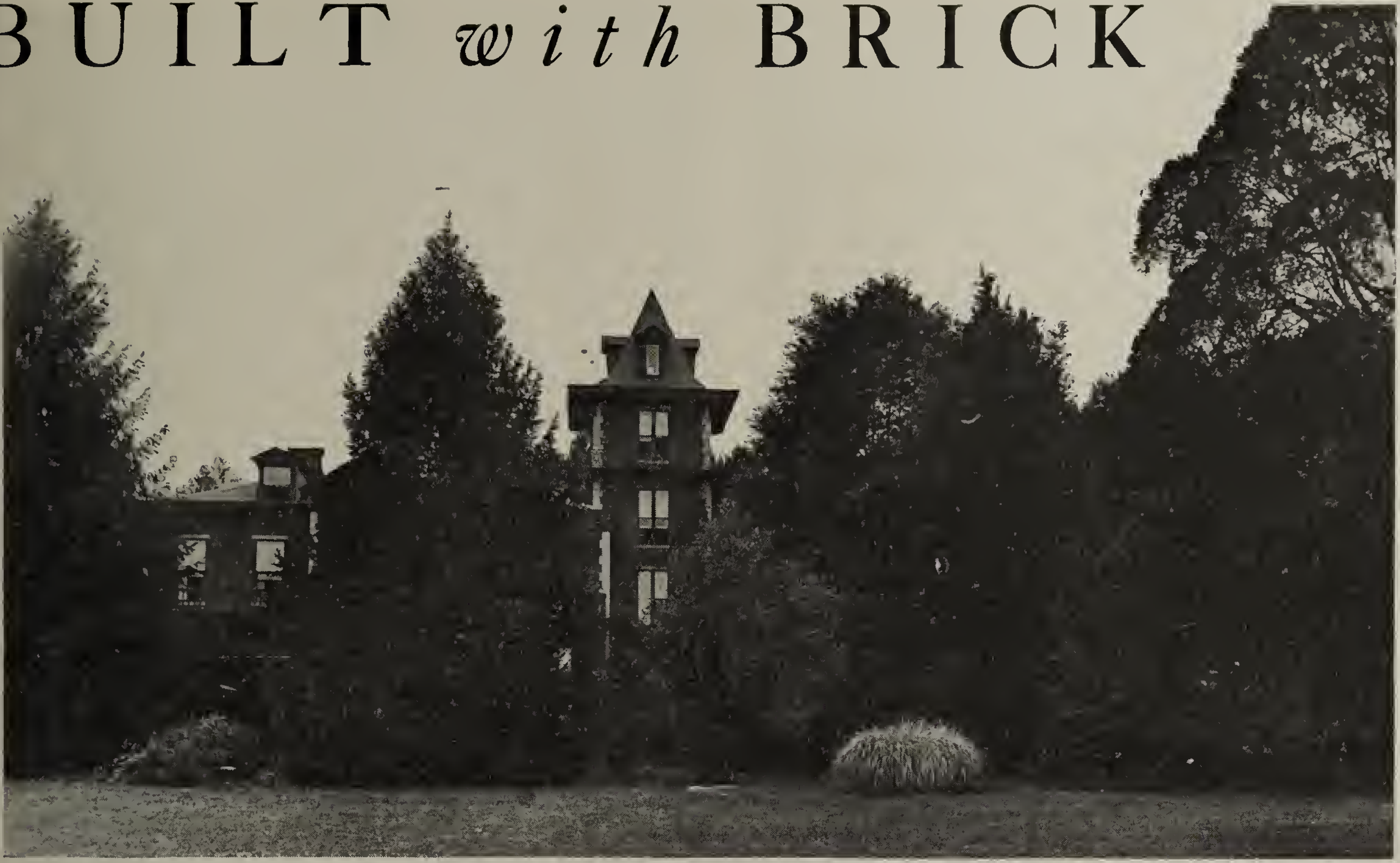
He admitted that there was but one way to plan a house and that was first to erect the interior and then surround it with walls. Posing as his own architect, he found that it was easy to make blunders with brick and mortar which proved very hard to correct afterwards. But those who have seen "Cedarcroft" think the author was fortunate because he planned it so well after all, and selected material that is in as good condition today as it was almost three score years ago.

BRICK WERE CHEAP IN 1859

Brick were low in cost at that time in Pennsylvania, the author finding, after paying all his help, that they cost him exactly $3.25 per thousand. For this reason he did not use them sparingly. The outer wall is two feet thick, including a hollow space of nearly two inches. Almost all the partition walls between the rooms are of solid brick. These walls are one foot thick. The hemlock joists supporting the floors are strengthened in all the rooms by strong iron rods passing thru them and bolted into these walls. It is a strong building.

The rooms on the first floor are large in size and are twelve feet in height. These rooms were heated, during the life of the author, by a cellar furnace and, during the coldest weather, could be warmed to a temperature of fifty degrees. The furnace was supplemented by wood

BUILT *with* BRICK



Altho Almost Sixty Years of Age, This Splendid Brick Mansion—"Cedarcroft"—Still Retains Its Pristine Health and Youthful Appearance

fires in the open hearths. The walls were built very massive to take care of these open fireplaces.

MADE WINDOWS TOO LARGE

Bayard Taylor loved sunshine. To him it was another word for life. Hence, he made a mistake in his calculations when he spaced off the windows, each of which was four by eight feet. After he had lived in the house for a time, he realized that each room could have had one window less, or at least could have had lost its equivalent in square feet of window space and the rooms would still have been well lit.

During the author's life, the mansion was not well shaded for the trees were small, but the verandas on the south side were then, as now, thickly covered with vines, such as glycine, ampelopis, bignonia and aristochia. With the aid of the massive walls they kept the rooms cool on the hottest day.

Every room on the first floor is finished with native woods—oak, cherry and black walnut predominating. Sixty years ago, such lumber could be purchased at forty dollars per thousand feet.

The main entrance to the author's mansion is thru the arched basement story of the tower. In winter the two arches on the northern side were probably closed by temporary shutters. The foundation walls of this tower are nine feet deep. They were started with a thickness of five feet, gradually diminishing to two and one-half feet on reaching the surface. In the center of each corner pier an old iron gas-pipe, four inches in diameter, was used as an upright support. These are bolted with horizontal iron bars into and thru the walls of the house. Almost sixty years have elapsed and yet this foundation has not shrunk a quarter inch, altho the tower is fifty feet to the eaves, with a roof resting upon it which is eighteen feet high.

The chimneys on the house are also of brick, but should have been twice as tall to give a greater strength to the draft in the flues, as well as for the sake of symmetry. Each window and door is set in a solid panel of brick, raised two inches from the face of the wall. Between the stories, a string-piece is formed by the arrangement of alternate brick, forming dentils, with two courses as a plain moulding above them. The cornice is formed in a similar manner with the ordinary brick used thruout the entire structure. This trimming arrangement has been most pleasing to the eye and blends well with the lines and shadows thrown upon the building by the shadow from the trees, now nearby.

The author would have changed the tower construction, had he realized at the time that the pointed roof was too heavy. The windows in the tower would have made a better appearance if they had been en-niched instead of extruded. However, the novelist did not look for beauty. He was satisfied because he attained his essential ideas, by getting space, light, solidity and external relief.

SOLID BRICK PARTITIONS FROM BASEMENT TO ROOF

The partition walls of solid brick rise thru the second story and garret to the roof, dividing the upper rooms in the same manner. This arrangement has made the house fireproof, owing to the absence of lath and plaster partitions.

This stately mansion has no room that could be called a parlor, for the novelist expected every room on the first floor to be in use every day, and this custom was followed during his lifetime. Neither was there a special room designed as a bed-chamber. Such visitors during the novelist's lifetime, as Whittier, Lanier, Stedman, Stoddard and other famous characters of the literary world, had to fare, while at his home, just as Bayard Taylor did in his own home, but all found great delight to be his guest, even tho there was no parlor nor guest chamber.

"Cedarcroft" is now the home of a school, the purpose of which is: "To maintain a preparatory and secondary school for boys under the normal conditions of home life." A large addition has been added to the rear, containing class rooms and apartments for twenty-three boys, besides a manual training shop and gymnasium. The first floor of the original building is devoted to educational purposes and contains the reception room, dining room, office, library, reading and recreation rooms. The second floor is occupied by the principal's apartments and four separate private rooms for older boys. The old mansion and the new addition are at present heated by steam and lighted by electricity. The two buildings are connected by a broad covered passage, in which are individual lockers for the use of students. In the rooms where the boys now study, many famous men of letters, statesmen and politicians were entertained. Among the most frequent visitors to "Cedarcroft" was Thomas Bailey Aldrich, who wrote the "Story of the Bad Boy."

This home of one of America's greatest poets is located in a picturesque section of the Keystone State. Over its site General Howe led his army while en route to the Battle of Brandywine, nearby. Here, Bayard Taylor spent his boyhood days and grew up into man's estate with lofty aspirations, unceasing energy, full of courage and pluck. His ancestry was of the best Saxon blood of Germany and England and in the American lineage he was from Quaker (Friends) stock.

Half of his life was spent in this village and in the county of Chester. At the age of three his father moved from the village to a farm not far away. The boy's education was acquired in academies at West Chester and Unionville. Early in life he became a printer as an apprentice in the office of the "Village Record." He did not like the setting of type, so he started to sketch, making horrid cartoons of his friends and himself. At the age of eighteen he was a much talked of poet. When nineteen years of age he completed "Ximena and Other Poems," a volume of one hundred pages. His parents, being in moderate circumstances, the revenue derived from this little volume, which sold well among his friends in Chester county, brought sufficient money to increase his library, altho he did not have enough cash in his pocket to pay the car fare to go to Philadelphia to read the proofs of his first volume, so he walked twenty-four miles to get there.

In many of his writings he brought forth the characteristic features of Pennsylvania life and landscape as he found it within twenty or fifty miles from Cedarcroft. In 1863 his first novel, "Hannah Thurston," was published, which depicted Quaker life in his own county. In this novel, he tells of his experiences at Cedarcroft thru the character of "Maxwell Woodbury." His next book was "John Godfrey's Fortunes," which was a reminiscence of Taylor's own experiences in the social and literary world in New York. One of his best works is "The Story of Kennett." It is considered one of the masterpieces of American literature. In this novel he has woven every landscape and scene around his birthplace—Kennett Square. Nor did he forget the farm houses of his neighbors, the highways and the local characters, the taverns, even the scenes of deathbed episodes. Some few of these historic spots, glorified in Bayard Taylor's novels, are still standing. Among these are the Unicorn Tavern, the Hammer and Trowel and The Anvil Inn.

Probably one of his most appreciated books is "Views Afoot; or, Europe Seen with Knapsack and Staff," which is the story of his experiences as he tramped over Europe. These letters gained for him a position on the staff of the New York "Tribune," and later, high honors in political life.

The Library at "Cedarcroft"

The Entrance to the Spacious Grounds

A New "Natco" Competition

With the two-fold object of encouraging the use of "Natco Tex-Tile" and promoting a further study of the small house problem, the National Fire Proofing Company of Pittsburgh, Pa., has announced a prize competition among architects and architectural draftsmen for a one-family house to be built of "Natco Tex-Tile" at a cost not to exceed $4,000. Four prizes are to be awarded—$500, $250, $150 and $100 respectively.

This competition is of unusual interest for many reasons, important among which is that it will greatly increase the use of rough-textured hollow-tile as a building material. It is anticipated that this material will do much toward solving the problem of securing a beautiful, permanent and fire-proof home for a cost that is not much above frame.

Minneapolis Brick Plant Operating to Capacity

Minneapolis (Minn.) Brick plants are operating to capacity, but in spite of this fact are unable to fill the demand, according to E. Young, secretary of the Builders' Exchange.

The Belt Line Brick Company, Minneapolis, Minn., is making 80,000 brick a day which is the full capacity of the plant. The officers of this concern report that its business is increasing at the rate of ten per cent. every year.

A FRENCH ROAD PUT *to* TEST *by* WAR

A recent "Associated Press" dispatch gives a very interesting account of how supplies are being carried to the French army at Verdun over a highway in motor trucks, since the railroads are no longer available for this purpose. Of particular significance is the fact that a large number of repairmen are necessary to keep this road to Verdun in passable condition. This is a real lesson in preparedness for these United States of America, and should be used as another strong argument for brick roads which bring comfort, satisfaction and economy in peace, as well as in war. The dispatch follows:

"Long before the battle of Verdun the French high command was aware that the railway between Verdun and the Ste. Menehould, thru the Argonne, would in case of an attack be cut by the Germans' heavy guns and that it would need to be supplemented by a motor transport system.

"Early in February, therefore, a special commission was appointed, which had to arrange a service of four thousand vehicles. All these had to be provided with great quantities of petrol, oil and grease.

"The general principle was for the Meuse railway to be restricted as far as possible to the transport of provisions, while the cars were to bring up men, ammunition and other material. The road to Verdun was reserved for motor traffic and the traffic was regulated by a special body of men.

"For the mending of the road a considerable number of experienced road menders was detailed. For policing the road was divided into sections, each in charge of an officer.

At noon on February 22, the day after the battle began, this organization was first put to the test. Within four hours the road was free of all horsedrawn traffic and has been so since.

"Every motor lorry carrying munitions covered an average of one hundred miles a day. Large numbers of troops were brought up without a hitch.

"An average of nearly two thousand lorries passed each day in either direction. Not a little of the success is due to the road menders, who dashed in between the rapidly running lorries and worked like mad men for a few seconds when the road was clear.

"Flour City" to Have Another Large Plant

Preliminary steps toward the enlargement of the business of C. H. Klein, Chaska, Minn., said to be one of the largest common-brick plants west of Chicago, were taken recently in the purchase of the St. Anthony brick yard and of the Flour City Brick Company's plant. The two properties are adjacent to each other in Northeast Minneapolis. The former was bought from O. J. Bower who had operated the yard for almost thirty-five years. The capacity is 4,000,000 brick annually. In the purchase were included eight acres of land. The yard which is an open one, is now being operated to capacity, twenty-five men being employed. The Flour City yard is very similar to the St. Anthony yard. It has been in operation for almost thirty years. The purchasers contemplate a consolidation of the two yards and the expenditure, within the next six months, of $50,000 for new machinery, driers and kilns. The next few weeks may see the formal organization of a company to operate the combined plants of which C. H. Klein will undoubtedly be president; Lambert G. Rose of Minneapolis, secretary J. R. Farnham of Minneapolis, treasurer. The last named gentleman was in control of the Flour City plant before it was purchased by C. H. Klein. Both of the recently acquired plants will be dismantled and a large new plant, modern in every detail, erected. The new owners contemplate the installation of several improvements, the nature of which they have refused to disclose. The combined area of the properties, seventeen acres, may be increased. The new concern, which will be capitalized at $100,000, will be known as the Minneapolis Brick and Supply Company with offices at 500 Plymouth building. It is proposed to manufacture an average of 150,000 brick daily.

Samples of granite face-brick presented by the administration of the Hennepin county (Minn.) workhouse to the board of education of Minneapolis recently caused considerable discussion as to the advisability of buying from the county or from those in the industry. The county plant, in answer to a call for samples from the school board which contemplates the early erection of a number of buildings, showed a crystal-faced brick for $18 a thousand and a brick of poorer quality for $14. The board rejected the former sample because its appropriations precluded purchase at the price named. The capacity of the workhouse plant is 3,500,000 common-brick and 2,000,000 sewer-brick annually.

A New Booklet of Fire-Place Designs

An attractive booklet containing a large number of designs for mantels built of standard size face-brick has just been issued by the Elzey Company of Parkersburg, W. Va.

As it is noted in the foreword, the object of this publication is to provide plans of fire-places and mantels of pleasing design that can be built with a minimum expense, moving them from the realm of luxury, perhaps, and placing them within the means of the average small home builder. Brick fire-places, built with special shapes and sizes, have become very popular and a large number have been sold to builders who are not compelled to look long at every item of expense that enters into the building of the new home. These fire-places are very beautiful and offer an attractive outlet for a certain class of face-brick, as high as fifty dollars a thousand being obtained for the product that enters into the construction of these mantels. However, there is a "Ford" market in which these fire-places cannot enter. Therefore, this new booklet fills a long-felt want in that it provides plans for fire-places in which the standard size brick can be used.

Complete working drawings of thirty-three different styles of mantels and fire-places are given, together with considerable information concerning different bonds and joints that lend attraction to the mantels. Special shelves, hearth designs and details of chimney construction also form a part of this booklet.

This little volume is being published in large quantities and is offered to brick manufacturers and dealers at a comparatively low cost. A copy can be obtained from "Brick and Clay Record's" Book Department by forwarding twenty-five cents. For larger quantities special prices will be made upon application.

Record Half-Year Predicted in Louisville

Brick manufacturers of Louisville, Ky., are nearing the close of the first half of the calendar year with the demand proceeding at a rate which promises the best half year's business for many a twelve-month, according to reports from the various manufacturers and dealers. Up until the middle of May, according to statements made by many of the brickmakers, the greater part of the volume of orders handled was for residence building, meaning orders which were individually small, but which loomed up large in the aggregate. There is a good deal of important work, however, in sight and the trade is looking for a busy season. An interesting development in local building is an increased demand for hollow-tile for fireproof construction. In this connection it may be noted that, under the new fire insurance code in Kentucky, the State Fire Marshal and his deputies are given greater authority to exercise supervision over the construction of buildings looking toward the prevention of disastrous fires. The State Fire Marshal and his deputies recently spent several days in Louisville, during which time they conferred with experts in the office of the Kentucky Actuarial Bureau on fire resistant building construction. It does not require a telescope to see that this attention to construction which has the merit of resistance to fire, will give brick, hollow-tile and other burned clay building materials the advantage.

Detroit Shortage Again Forces Outside Purchase

Unusually active building conditions in Detroit continue to prevail, recently forcing the brickmakers in that city to make another outside purchase of several million brick, according to F. R. Dickinson, president of the Builders' and Pavers' Supply Company. This time the brick to be used in aiding local manufacturers to supply the demand are to come from Ohio plants. Millions of brick have already been contracted for in Chicago to help meet the local shortage brought about by extensive winter building that used up the supply of brick as fast as it was manufactured.

Building operations during the first three months of 1916, in the city "where Life is Worth Living," registered a gain of forty-eight per cent. in value over the same period of 1915, this fact explaining the cause for the shortage in brick.

Officers of New Milwaukee Brick Company

In the April 18 issue of this magazine an item was published pertaining to the purchase of the Pennsylvania Coal and Supply Company of Milwaukee, Wis., by the Wisconsin Base and Fire Brick Company, in which it was stated that Ralph van Loo, Robert Steele and E. M. Kratz were the interested parties. This is partly in error, as information reaching us since the date above mentioned, shows that Emil M. Kratz is president of the new company, John J. McCoy, vice-president and treasurer and Robert J. Steele, secretary. Both Messrs. Kratz and Steele were formerly connected with the Pennsylvania Coal and Supply Company, being in its employ for a period of ten years, while Mr. McCoy was formerly with the Streator (Ill.) Brick Company.

A FACE-BRICK EXHIBIT *with an* OUT-*of*-DOOR ATMOSPHERE

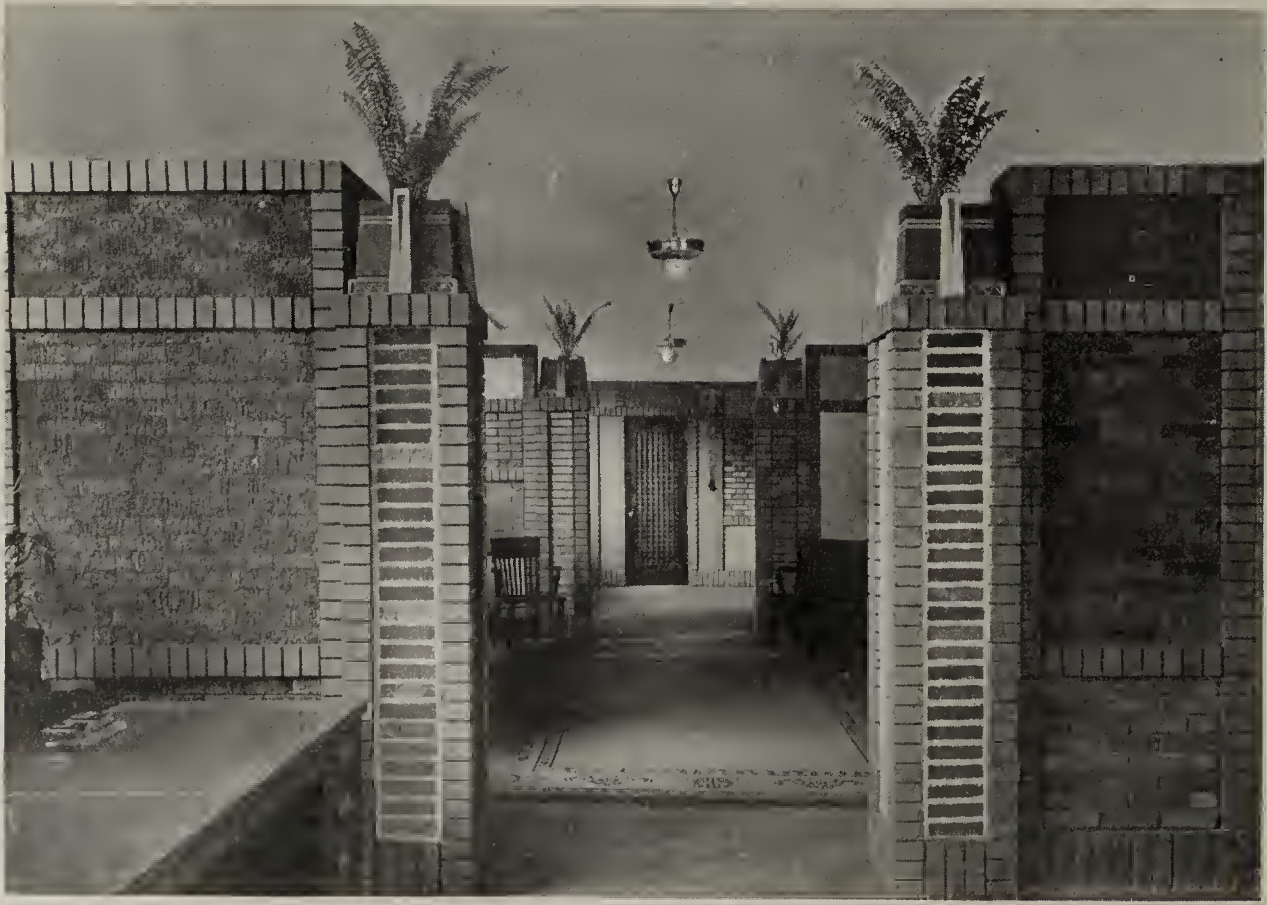
ARTISTIC EXHIBIT rooms are common among face-brick men, and the display of today, compared to that of not more than ten years ago, echoes the artistic development of face-brick within the time mentioned.

There was a time—and it is not so many years since—that a man whose name was (and is yet) well known in the face-brick industry, said that the sole purpose of an exhibit room was to impress the visitor with the importance of the concern that devoted a part of its office space to the showing of brick panels.

In other words—the important thing was the *extent* of the exhibit—not its artistic worth, nor its educational possibilities.

That this has changed is clearly shown in the illustrations that are published on this page—illustrations showing a part of the exhibit that is maintained by the Hydraulic-Press Brick Company at Chicago. The effect of the rich coloring of the brick—much of which is *matte*—is enhanced by palms and live, growing flowers. The vases that are seen at each side of the piers that give entrance to the different rooms are deep, terra-cotta red, with light green, blue and buff decorations.

The rugs are of a tan color with a border design in brown and light green. They are of woven grass and give the blending note between in-door luxury an out-door utility.



The arrangements of these rooms was greatly influenced by the direction of the light, which comes from two sides, one of which is, however, very much longer than the other. In order that this light could be used to its fullest extent, partitions were built toward the center of the room, starting, in each case, from the window jambs, and concluding at one of the piers shown in the illustrations. The partitions were taken up again, as will be seen, and continued to the rear wall.

In this way, the various textures are given the light that they require to bring out their selling points. That this is accomplished will be seen by a close inspection of the pictures, or better, by a visit to the exhibit rooms, which are in the Chamber of Commerce Building, in Chicago.

THE DESIGN *and* CONSTRUCTION *of* CONTINUOUS KILNS

Some Clarifying Notes on a Much Misunderstood Piece of Clay Plant Equipment Which Had Its Origin in Europe

By A. F. Greaves-Walker

Author of "The Design and Construction of Down Draft Kilns," "Setting Down Draft Kilns," "Running a Plant to Capacity" and "Dies for Hollow Ware."

(*Continued from the May 2 issue.*)

THE CROWNS should be built in the most careful manner. The mortar, which, of course, should be fire-clay, should be laid on as thinly as possible with a trowel and each brick malleted down to the course level. With the brick ordinarily supplied for kiln work, it is impossible to lay up a permanent crown with dipped brick. The brick work, both squares and shapes, are of such uneven thickness that the difference cannot be made up without the use of a trowel, no matter how skilled the mason is. If a clayworker insists on dipping his brick he must specify the allowable variation in size that he will accept when buying the brick. In this way he may get what he wants, but in no other.

The proper number of wedges and squares should be used to make the arch come up perfectly. The key should fit so tight that it will not go more than half way to its seat when pounded with a hand mallet. It should then be driven home with a wooden block and sledge hammer. In the tunnel kiln the crown is not subjected to the severe flame flash that a periodic kiln crown gets above the flash walls. The heat is quite evenly distributed and the crown is heated up and cooled off under the best possible conditions. For these reasons a tunnel kiln crown, if well built and supported on good, well backed up walls, will have an exceedingly long life.

On top of the nine-inch crown proper a 4½-inch arch should be built. This may be of common-brick laid in clay or shale mortar. If the work on this false crown is well done, it will add considerable to the strength and life of the fire-brick crown. The spandrels should be brought up solid to the top of the crown.

Expansion joints two inches wide should be left in the crown every twenty feet at the same points at which the expansion joints in the lining occur. These joints should extend *thru the nine-inch crown only*. The 4½-inch false crown should cover the joints in the nine-inch crown but should have *one-inch expansion joints* left in it at other points twenty feet apart. On top of this joint a rowlock of brick should be laid as in Fig. 20. If the expansion joints extend thru the entire crown and are merely covered with a rowlock, trouble is almost certain to occur within a year or two. The constant movement of the crown shifts the loose brick covering the joints and finally one or more drop into them and wedge them apart, resulting in the shifting of the entire crown. Moveover, as the brick covering shifts, the earth filling begins to work its way into the joints with the same result. At the points where the false crown covers the expansion joints, fire-brick should be used instead of common-brick if the temperatures to be attained warrant it.

While a tunnel kiln crown built of nine-inch squares and shapes, with a covering arch of common-brick, will give perfect satisfaction when properly constructed, a *much better* but slightly more expensive crown can be built of 13½-*inch arch blocks made to order for the required radius.* These blocks cost only a little more than their nine-inch equivalent in standard brick, and should be as large as can be conveniently handled by the masons. The blocks should be marked by the manufacturer and laid up according to blueprint. Unquestionably, crowns built in such a manner represent the highest type of construction and, it is only because most clay plant owners prefer the path of least resistance and will not go to the trouble of ordering special shapes, that more such crowns are not built on either continuous or periodic kilns.

Drop arches are usually a source of constant trouble in a tunnel kiln on account of the everlasting necessity of repairs. This is generally due to the use of standard brick. The best practice calls for an arch eighteen inches deep and it is a pretty hard matter to build these arches, and make them "stay put," with nine-inch squares and shapes. Splendid results have been obtained by the use of large eighteen-inch fire-clay blocks. These blocks must be made to order and the units should be as large as possible for convenient handling. If the blocks are hard burned, of perfect fit, and are laid up with a dipped joint, drop arch troubles will disappear.

When coal-fired chamber kiln crowns are built of nine-inch brick, the same construction rules should be followed as have been laid down for tunnel crowns, but in this case there is far more reason for the use of the large blocks. In the tunnel kiln the arch is built in the direction of the greatest expansion and is not exposed to any great thrust from the sides, but in the chamber kiln the chambers are built at right angles to the length of the kiln and are subjected to linear expansion and to the thrust of the chambers on each side. This thrust has a tendency to "roll" them in the direction of the advance of the fire. Most of the crown deformation has been due to the half circle design, for it will be obvious to anyone that the higher the arch, the greater will be the ease with which it can be crushed out of shape. The fact that any movement which takes place in the crown must be in the mortar joints, is another reason for the use of large blocks as these eliminate a very large percentage of the joints.

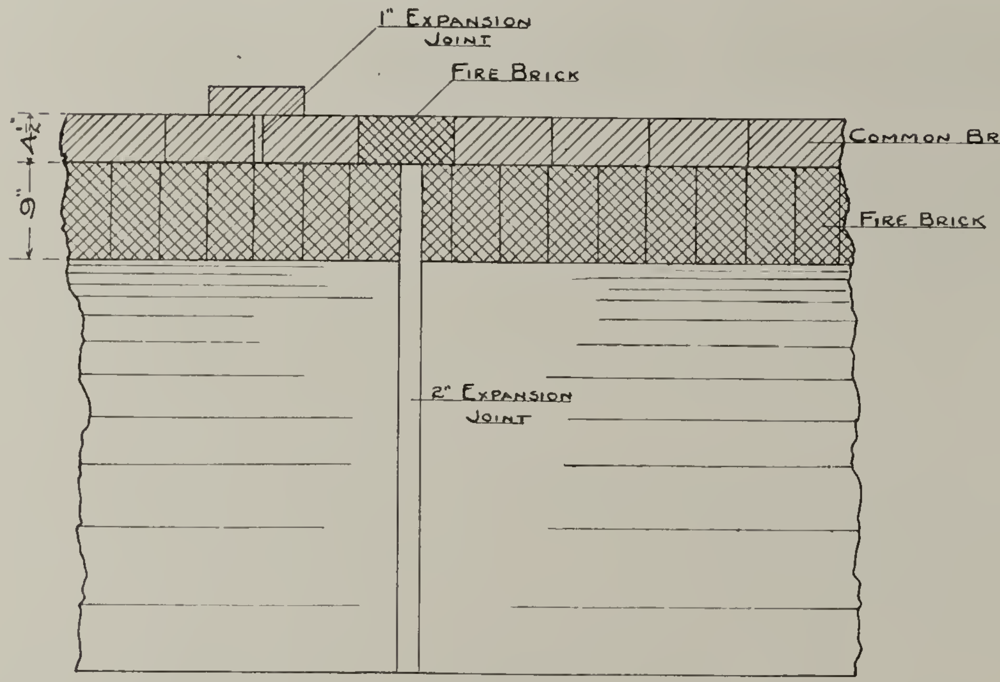


Fig 20 - Section of Crown Showing Expansion Joints

In the coal-fired kilns the feed holes should be constructed of heavy, hard burned blocks made to fit perfectly in the crown. These feed holes are subjected to considerable wear and the use of standard brick will prove a source of continual repair expense.

GAS-FIRED KILNS HARD ON CROWNS

In the case of the gas-fired kiln, entirely different conditions are encountered. Whether they be fired on one side or both, the crowns are subjected to a constant flame bath during the firing period, the effect of which is severe. Experiments have been carried on long enough to determine the fact that the nine-inch crown *will not stand up* for any length of time under the conditions to which it is subjected. In this case there is no alternative, *the 13½-inch special block crown must be built.*

In the gas-fired kiln which has fires on only one side of the chamber, the cost of crown repairs has been staggering. All of these crowns have been built of nine-inch squares and shapes, and have had a half circle arch. The kilns have scarcely been put into service before the crowns began to flatten over the bag wall and inside of a few years, it has been the general rule that crown replacements and repairs began. Replacing a continuous kiln crown is not the comparatively simple matter of replacing a periodic kiln crown. In the former case it is necessary to remove and replace tons of filling, and often to rebuild flues which are disturbed, to say nothing of the necessity of bracing up the crowns on several chambers on each side of the one being repaired, to prevent collapse. The cost, therefore, amounts to about twice as much as would be the case in a periodic kiln crown of the same size.

There is not the slightest question but that a long-lived crown can be built on a kiln of the one-side-fire type, but it must be borne in mind that, being subjected to very severe and unusual conditions, every precaution in regard to design, material and workmanship must be taken. Any attempt to cheapen or slight the work will multiply the original cost many times over after a few years of operation.

In setting the forms for a crown it must be remembered that it will settle about one inch after the forms are removed. Due allowance must therefore be made for this settle.

Bracing between the crowns of a chamber kiln is an important detail. In the coal-fired and double-gas-fired types it is very easy to brick up solidly between each crown and *this should be done.* When this is done it is almost a guarantee against any deformation.

In the case of the one-side gas-fired kiln the gas distributing flues interfere with solid bracing. In this case the distributing flues should be placed as high as possible and solid brace walls from one crown to another be built up to the bottom of the distributing flues. Any attempt to brace against these distributing flues will result in their being crushed, and this must be avoided.

Filling over the tops of the crowns should not be done until the entire battery or kiln is completed. The easiest method of doing this is to hoist a dump car to the top and run tracks the full length of the kiln. The material can then be spread evenly over the entire top. Many kilns have been badly damaged during the operation of filling thru commencing at one end and filling to the required depth before moving on. This throws an immense weight on one portion of the structure and creates a strain that, in extreme cases, may cause collapse.

This is especially true of chamber kilns. To concentrate a load on any one chamber at a time when much of the masonry is in a green state will invariably cause the crowns to "roll" and, in some cases, the movement has been so marked that portions of the kiln have had to be rebuilt.

As the filling is carried to the top it should be evenly distributed over the whole top from one end to the other. Primarily, this filling is intended as an insulator and naturally the thicker it is, the greater its insulating value. As a rule this filling should not be less than two feet thick over the highest point of the crown. It may be heavier if the plant owner is willing to stand the expense. The walls of the kiln must, of course, be brought up to the level of the top of the filling.

A covering of six inches of ashes next to the crown makes an excellent insulator, when they are available. For the balance of the filling, almost any sort of earth may be used. The platting on top of this filling should not be laid for six months or a year after the kiln commences operation if a good level floor is desired. The filling is bound to settle and shrink for a long time and nothing will prevent a poor, unsatisfactory job if the platting is put down at the time the kiln is built.

NO ECONOMY IN USE OF CHIMNEY

No attempt will be made to describe chimney construction. Very few American clayworkers will consider the use of a chimney in connection with a continuous kiln, and the few who still believe that a chimney is cheaper than a fan, would do well to study the problem from all angles before making a decision.

It will be admitted, of course, that a fan is cheaper to install than a chimney, so the whole question revolves around the point of operating expense. In connection with a continuous kiln, the chimney is not as cheap to operate as at first appears. A chimney is always affected by atmospheric conditions, sometimes to the point where the fire scarcely moves, while with a fan a constant speed can be maintained under all weather conditions. A chimney always limits the kiln to a certain burning speed even under the best conditions. With a fan this "best chimney speed" can be increased from fifty to one hundred per cent. As the conduction and radiation on a kiln are practically constant under all operating conditions, this increased speed reduces the proportionate heat loss. Also, with a fan, the waste gases can be exhausted at temperatures of from 50 degrees C. to 75 degrees C. when the kiln has a watersmoking arrangement, while for maximum efficiency the mean temperature of the gases in a stack must be maintained at 300 degrees C. This means that the exhaust gases at the base of the stack must be kept at from 400 degrees C. to 500 degrees C. to allow for cooling as they rise to the outlet. It will be seen that this item in itself is worthy of consideration and goes a long way towards overcoming the cost of fan operation.

The size of the fan is very important. Small fans should always be avoided on account of the high speed required. It is much more economical to install a large unit that can be operated at a low speed because the power required increases as the cube of the speed, which means that when speed is doubled, the power required is multiplied eight times.

FAN SHOULD HAVE COPPER BLADES

The best type of fan for continuous kiln work is the overhung induced draft or suction type. *The fans should always have copper blades and cast iron arms.* Sheet iron blades and mild steel arms are eaten away so quickly by the gases that they are practically useless. Even heavy copper blades require replacing every three or four seasons. Two fans should always be provided to prevent shut-downs. High speed engines or motors require repairs, belts will break and bearings burn out, but the kiln must be kept running, and it can only be kept running if an auxiliary fan is ready for instant use. When electric power is available on a steam operated plant it is a splendid plan to have one fan motor-driven, and one, engine-driven. In such a case it is almost impossible to have the kiln down for more than a few minutes at a time. On electrically driven plants variable speed motors should always be provided for the fans. The control such motors give, makes it almost unnnecessary to handle the dampers in order to regulate the draft. Also the results are more positive when the draft is regulated by the fan speed.

The fans should be covered with a brick housing, as a steel housing is quickly destroyed by the gases. In building such a housing, provision should be made for examining the fan from time to time and also removing it for repairs.

Even when using a fan, a discharge stack is necessary. Such stacks should be high enough to carry the gases well above the yard. When the stacks are low the waste gases drifting thru the yard and buildings will often seriously interfere with the work of the men.

SOME POINTS REGARDING ROOF CONSTRUCTION

Practically all continuous kilns are provided with roofs. These vary from the flimsiest kind of a shed structure to the best type of steel construction. The kiln roof presents a problem that is well worth a little of the clayworkers' consideration. It must be remembered that, as a rule, they are large affairs, a double battery kiln of fifty thousand daily capacity requiring a roof measuring approximately one hundred and twenty-five by two hundred feet; that they are generally a bad fire risk; are subject to a lifting wind pressure due to their not being protected by side walls; are exposed to the ordinary wind pressure and, in many instances, to very heavy snow loads. Consideration must also be given to the fact that the roof is subject to the radiation from the kiln. When built of green lumber, this heat will draw, strain and twist the trusses and timbers to such an extent that the roof is unable to withstand the hard service put upon it and collapses or partially collapses during a high wind or under a heavy snow load.

There is little question but that men of experience will agree that the wooden roof is to be condemned. Generally, its size and weight compels the use of heavy, uneconomical trusses which have a tendency to weaken under their own weight. Considering the cost of lumber, the high insurance rate or the inability to get insurance, and the upkeep, the steel frame, metal-covered roof is little, if any, more expensive in the end.

DO NOT BUILD DOUBLE HIP ROOFS

In the case of the double battery kiln it has been the custom to build roofs of the double or triple hip design. Such roofs should be avoided for several reasons. They are more expensive to construct because they require more material; the valleys between the hips collect and hold large quantities of snow, and it is almost impossible to so construct them that the water from melting snow and from rain will not leak onto the kiln to a greater or less extent after the roof is a few years old. It is by far the best plan to construct the roof with a single ridge, no matter what the span may be, for the same number of supports can be used for the trusses as in any other type. (*To be Continued.*)

A "BUILD *with* BRICK" MESSAGE *in a* PARADE

One of the Floats of a Live Crescent City Dealer, Showing a Brick House, Which Appeared in the Industrial Parade Held in New Orleans a Month or More Ago.

MAKING FARM DRAINAGE

a matter of

PUBLIC RECORD

A Movement Having Many Benefits for the Drain Tile Manufacturer, Which Should Receive His Unqualified Support

¶ Do you Know What the Tile Buried on the Farms of Your Customers is Doing? What Proof Have You That it is Even There?

¶ The Following Article Will Answer That Question for You, and Answer It in the Negative.

¶ This Paper was Originally Read Before the Iowa Clay Products Manufacturers' Association by John W. Anderson, Formerly a Manufacturer of Drain Tile. So He Knows What He is Talking About.

¶ We have Asked Mr. Anderson to Give Some Further Details Regarding His Plan for the Public Record of Farm Drainage Installations and This He Will Do in a Series of Articles to Appear in Subsequent Issues of This Magazine, of Which This is the First.

THE ATTITUDE of the farmer toward tile drainage, while in the main, appreciative, has been in some respects fundamentally wrong. He has looked upon it too much as a curative agent and has fallen far short of recognizing its real possibilities. He has been willing to use tile in a haphazard manner to rid his land of puddles and ponds, but until quite recent years, he has not begun to realize the greater benefits that come from most thoro and intensive tiling. Today you may see an occasional farmer who employs an experienced engineer and underlays his entire farm, both high land and low land, with a system of tile drains having laterals from thirty to fifty feet apart, but he is regarded by many of his neighbors as their grandfathers regarded his grandfather when he decided to use four-inch, instead of two and one-half-inch tile to drain a twenty-acre slough. They think he is wasting good money.

There are companies in Illinois that grow large quantities of farm produce, and which have made a practice of leasing land for periods of five years and longer and tiling it at their own expense, early experiments having demonstrated the investment to be a profitable one. They started a few years ago to lay their laterals one hundred feet apart. This distance was later reduced to fifty feet with satisfactory results.

In 1914, one of these companies owned approximately twelve hundred acres so tiled. Its manager states that when the company started with laterals one hundred feet apart, they felt that they had gone the limit. Subsequently, on reducing this distance to fifty feet, they were sure that they had carried the work as far as they could go with profit. But now he feels confident that they will go over the fields again and divide this spacing in two.

GETS HUGE RETURN ON DRAINAGE INVESTMENT

This company has carefully compiled statistics, covering in consecutive order a sufficient number of years to include seasons of every extreme, that show, thru increased yields, annual profits on its total investment in drainage improvements of from *twenty* to *seventy-five per cent.*

These companies, in planning their installations, employ an experienced drainage engineer and all work of the contractor is subject to his inspection and acceptance. They seldom attempt to utilize any part of the drains already in service, but disregard them entirely in designing their new systems.

On one tract, purchased in competitive bidding at what was considered in the neighborhood to be a high price and already well drained according to the standards of a few years ago, another company promptly laid an entirely new drainage system with parallel laterals fifty feet apart. After its first crop matured, it refused a *cash offer* for the entire tract at an advance of *double the cost of the drains.*

The above cases are cited because, among the instances coming within the writer's experience where drainage has been tried on so thoro a scale, they offer the best opportunity for ascertaining from actual records, the amount of drainage in service and the profit realized on the money invested.

FEW FARMERS HAVE MAPS OF TILE DRAINS

In the offices of these companies are kept blue-prints showing the location, depth, and so forth, of *every* drain which they have installed. The average landowner, however, has but a vague idea regarding the location of his drains. *Not one in one hundred has a map of any kind showing where tile have been laid.* Thus we find a most important industry—that of manufacturing drain-tile—in possession of but very little *definite* information with reference to the character and extent of its most productive improvements.

The need for growing larger crops on smaller land areas has made active a number of agencies in the development of scientific methods in agriculture. Considerable progress has been made along the lines of artificial fertilization, the improvement of seeds and the preparation of the seed bed. Farming is becoming more of a business and less of a gamble. Science is gradually replacing luck as a factor in determining results. The evolution is necessarily slow, but it requires no prophet to foresee that we are rapidly working toward the time when each acre of land must be made to yield the utmost that proper conservation of fertility in the soil will permit.

Under-drainage, thruout large sections of our country, has been, and will continue to be, *a most important factor* in agricultural development. *How long its real possibilities are to fail of general recognition will depend on the time required for those most directly interested—the manufacturers of drain-tile—to unite upon a definite plan for co-operation in putting the whole drainage proposition on a more scientific basis.*

Some strenuous, but rather sporadic efforts have been made toward broadening out the demand in the promotion of the use of drain-tile. The results obtained from such movements, thus far, have not been permanent. They have lacked momentum and have failed of cumulative effect, largely because they have run counter to underlying influences.

Before any broadly constructive results can be obtained, psychological and other factors must be considered in directing, along proper lines, powerful forces with which the whole situation is charged and which, taken at their source, can be utilized to work a revolution thoro and positive in its operations.

WHY NOT LAWS PROVIDING FOR A DRAINAGE RECORD?

We have laws providing for the maintenance of public records showing exactly the location and area of tracts of land. A most productive tract may not have been capable of yielding an income sufficient to meet taxation before being tiled, *yet there are no laws providing for a public record of the tile drains which reclaim the land.*

Such laws are needed as the foundation upon which to build for better drainage practice. They will help to transform the chaos of present conditions into something resembling scientific order.

Some of the simpler psychological effects of the enactment of such laws are easily foreseen. The mere fact that the state has so recognized its importance will, in itself, add dignity to the whole proposition of under-drainage.

Such records will eliminate many of the hazards of dealing in land. There are so many different ideas of "thoro drainage" that the seller may honestly believe and represent his farm to be thoroly tiled and the purchaser, having more progressive ideas of drainage, inadvertently buy something he does not quite want. A public record will prevent some of these unfortunate misunderstandings and will give to the owner of the farm, in selling or in borrowing, full credit for the amount of tiling actually in service.

The knowledge that drains can be made a matter of record will destroy any reluctance a certain class of speculators might have about tiling farms during the short period they hold title to them. Representations on the part of the land agent with reference to the drainage actually in service may be made *more accurate* and *convincing.*

The owner having to plan extensions or improvements in his drainage will find such records a convenience. They will enable him to adapt his additions to his general plan of drainage and will thus make for efficiency and economy.

In locating ditch trouble, the maps will prove useful. Usually such trouble is not discovered until the season is on and any delay in correcting it holds back crops.

One financier to whom the plan has been explained has said that he considers it of great practical value for improving rural credit conditions. The value of farm land is determined by its capacity to earn money. *A farm properly tiled is a better credit risk than one only partially tiled.* Increase in the value of security or in the certainty of income always tends to reduce interest rates. Given an opportunity to determine accurately the extent of the tiling on each tract, *companies making a business of loaning on farm security may show a preference for loans on well-drained land,* and this preference may be reflected in interest rates.

SPECIAL LOANS FOR TILING UNIMPROVED LAND

With means for making drains a matter of definite public record, instead of something buried out of sight and more or less forgotten, there should be little difficulty experienced in establishing a practice of making *special drainage loans for tiling unimproved land.* A man owning an unimproved tract might employ an engineer to lay out a thoro system of drains and to prepare an estimate of the cost of installation. Say the land is worth $30 per acre as it stands undrained and the estimated cost of drainage is $25 per acre. Ordinarily no $30 land would stand for a $25 loan. But after the land is drained, it has a value of, say, $100. A $25 loan on $100 land is desirable, so it may be arranged to advance $25 per acre in installments which will meet the requirements of the work, as maps with proper affidavit of the engineer and land owner, are recorded showing the progress in laying the ditches. A similar procedure might be followed in tiling, along intensive lines, land already partially drained.

In a letter to "Brick and Clay Record," under date of December 30, 1914, presenting this plan briefly for publication, the writer said in part:

"The plan also promises valuable aid to state and national agricultural departments, by providing accurate data as a basis for comparative statistics, and will no doubt be welcomed as a means for broadening the scope of their service."

Bearing on this phase of the matter, the following quotation from a letter received under date of March 9, 1915, from Prof. A. D. Wilson, Director of Agricul-

A Tale of Two Fields on an Iowa Farm, in Which the Moral is Plainly Indicated. It is Not Hard to Distinguish Which Field is Tiled for Those Who Know it Is There. A Public Record of This Installation Would Furnish a Strong Argument and Convincing Proof to a Prospective Purchaser of This Farm, or to a Banker Who Might be Asked to Loan Money on It tural Extension, University of Minnesota, is given:

"The proposition of registration of tiled farms is new to me, but the plan certainly looks feasible. In fact, I can see no objection whatever to it, and can see many important advantages which would come from such registration."

Since the writer launched the plan in 1914, he has discussed it with many prominent and representative men and has not heard one serious objection raised. It seems free from any undesirable features and full of promise of benefits for all.

However, much careful work will be required to see that these laws are passed in a form that will make them most effective, and the fullest benefits cannot be obtained without beginning, promptly thereafter, a well organized effort to take every advantage of the opportunities for improvement which will be opened by their enactment.

Just what progress will be made is largely up to the drain-tile manufacturers. It may not seem fair that, out of their slender and final profits, they should be required to educate their trade to the much greater and continuous profits to be made thru the fullest use of their product, but the condition is just that. It has been demonstrated repeatedly in modern business that life is too short for us to be satisfied with that growth in sales which results simply from the production of an article of much merit. The path-to-your-door theory of sales promotion does not meet the conditions of this age of brick pavements and motor cars.

Given a product which for years has demonstrated its ability to yield indefinitely in service an annual return of from twenty to one hundred per cent. on the total investment necessary for its installation, it would seem that you have a selling proposition which is susceptible of considerable development. You are selling this product to a land-owner who considers five to six per cent. a good stiff rate of interest on money he borrows for improvements. *Your field,* in the light of results obtained by those progressive farmers who have multiplied by two or three our former standards of thoro tiling, *you have scarcely scratched.*

Your customers generally are prosperous, a fact which other manufacturers have recognized. They are considered, as a class, a good prospect for the sale of automobiles, victrolas, player pianos and many other things their fathers never had a chance to own, and which are not in a class with your product as a profitable investment.

You have confronting you, in a new form, the old, old problem of making two blades of grass grow where but one grew before, and your reward will be measured by the service you render.

While you will need to call in, for some phases of this work, the trained advertising man, as you now call in the chemist or the freight rate expert, your general basic plan for sales promotion must be founded on a sound knowledge of, and actual experience in, your own business, and must be guided in its operations by your own best thought. You have the strength to do these things in a big, fine way. If you have the will to do them, they will be done.

BRICK STREETS GIVE GOOD SERVICE *in* ALABAMA CAPITAL

DIXIE has a keen appreciation of good paving and naturally turns to brick, so a delegation of paving-brick manufacturers learned recently on an expedition south of the Mason and Dixon line to find out what that section of the country is doing to improve its roads with permanent materials. One of the leaders of the party from the North was H. H. Macdonald, assistant secretary of the National Paving Brick Manufacturers' Association, and under his guidance, Montgomery, Ala., was visited and its pavements inspected.

Dexter Avenue, Looking East Toward the Capitol, the Principal Retail Street of Montgomery, Ala. This Thorofare is Paved with Well Grouted Brick, Which Is Now In Excellent Condition After More Than Twenty Years of Service

The visitors learned that Montgomery was among the earliest cities in the United States to recognize the merits of grout-filled brick paving. There are streets in that city paved with brick, which have been in use for more than twenty years and yet have required practically no repairs, altho laid upon a slag base under specifications, while advanced for the time, would be considered ancient in the light of present day practice.

In the Alabama capital, brick is regarded as a heavy duty paving material. Eighty-five per cent. of the brick paving is within the fire limits of the city, including Dexter avenue, the principal retail street, which was paved in 1895 and which is still in excellent condition. Perry and Monroe streets, also laid in 1895, bear little evidence of their twenty years of service.

Further improvement in streets and roads is part of Montgomery's program for municipal progress. This commercial city, realizing that its welfare and prosperity are dependent in a large measure upon the prosperity of the territory which it taps, is making its plans accordingly and hopes, in the near future, to have a better system of rural roads radiating from its business centers to the surrounding country.

Montgomery is fostering

Cotton Growers Waiting for a Rise in the Market at Montgomery, Ala.

and encouraging better farming in Alabama and points to Montgomery county as one of the most progressive agricultural regions in the United States. Like many other southern states, Alabama is depending less upon cotton, which, in the past, has left the prosperity of this section of the country at the mercy of the fluctuating demand for this single crop.

The Montgomery chamber of commerce has taken up the diversified farming propaganda and is pushing it with considerable vigor. It has employed a competent farm advisor and live stock inspector who co-operate with the state and with farmers' organizations for better agriculture and stock raising. The result of this policy has been to create a large grain and live stock market in that city. In fact, a packing house is a recent enterprise which has had the backing of the chamber of commerce.

All of this has been helped by improved roads. But more than that, enthusiasm for better highways has not died down with the coming of good roads; it is increasing in volume. A newly organized automobile club, for instance, is continually at work on good road projects so that the city may secure the greatest benefit from the improved condition of many of Alabama's farms.

Vitrified Clay Segment Blocks in Sewer Construction

By J. M. Egan, Jr., C. E., as Read Before the Illinois Society of Engineers and Surveyors

AT THE PRESENT TIME, there are on the market two vitrified sewer blocks of different design, one being a single-ring block and the other a two-ring block. The single block has a ship-lap joint on the ends and a tongue and groove joint on the sides, while in the double block, the laps and joints are made in the construction of the sewer and the blocks are placed one on top of the other as in a two-ring brick sewer. The blocks are hollow longitudinally with web braces. They are made for sewers varying in size from 30 to 108 inches in diameter, and according to size, weigh from 40 up to 120 pounds, are 18 and 24 inches long, are from 9 to 15 inches wide, and are from 5 to 10 inches thick. Short lengths are also made for convenience in construction and for use on sharp curves. Special blocks are also made for connections and junctions. The blocks are also made for use in egg-shaped sewers, in which case, an extra heavy base block is furnished.

In constructing a sewer with the blocks, the method of excavating the trench does not vary from methods used in constructing sewers of other types. If the soil excavated is stiff enough to permit, the bottom of the trench should be shaped to conform to the outside of the sewer, thus forming a good foundation and eliminating excessive tamping. A template may be used to procure this shape as well as a means of guidance for laying the blocks. The first block is laid in the center of the trench to line and grade and the blocks comprising the invert are laid to it. As the blocks of the invert are laid up, care in back-filling behind the blocks must be practiced. The joints, both end and side, must be mortared about one-quarter inch thick, and the blocks must be laid broken or staggered. The joints of the invert may be pointed up as they are laid. Careful tamping on each side of the spring line behind the blocks will give much added strength to the sewer and this tamping should continue to the second course above the spring line. Wooden forms are used for the arch and are usually placed a little bit higher than the required diameter in order to allow a little wider space for the key block. The blocks are then laid up on either side of the form, the key block finally inserted, the form immediately removed, and the arch will then settle into place and form the correct diameter. Back-filling can then be started at once. In laying these blocks, experienced bricklayers are not needed, as the ordinary pipe layer can soon pick up the art of laying the blocks. If wet and quick-sandy conditions prevail in the trench and sheeting is necessary, it must be driven low and cut off and left in the trench below the spring line. In cases where steel sheeting would be used, very careful backfilling must be resorted to and as the sheeting is slowly pulled, water flushing must be carried on as it is very necessary that a good bearing be given the invert. In cases where the soil conditions in the trench bottom are very bad, planks may be laid under the first block or a cradle may be used for holding the first few blocks. However, there are no disadvantages in using the block in bad trench work that are not encountered in using other materials and it is claimed by some of the engineers that have used them in bad trench conditions, that they are to be preferred to any other type of material.

The cost of laying the blocks, of course, varies with the efficiency of the contractor and his organization, and with the varying labor conditions. It should not exceed one cent per inch in diameter of the sewer per lineal foot; this to include labor of laying, cost of mortar, and backfilling up to the spring line. The cost of the block is moderate and has the advantage over the large sewer-pipe in that it takes a smaller freight rate, the breakage in transit is exceedingly small, and the cost of handling from cars to trench and in the trench is low as it is easily a one-man job. The cost of the block sewer complete is undoubtedly lower than the cost of a reinforced concrete sewer, and on account of its lower coefficient of friction, smaller sewers may be used with as good results as large size concrete sewers with a consequent lowering of cost. There is only seven per cent. of surface exposed to the jointing material in the block sewer, and the highly glazed impervious block is certainly superior to any other sewer material. Good speed in construction can be made and it is not necessary to have much trench open ahead of the block laying and, as mentioned before, backfilling can be done as soon as forms are lowered and the work cleaned up generally as it progresses. All of these points tend to lower the cost of this type of sewer with the advantage of giving a more efficient structure.

Good connections can be made between segment block sewers of different sizes as well as between segment block sewers and pipe lines. The segment block sewer can also be adjusted to fit sharp curves with very little loss of efficiency. Special blocks are made for the small connections with the pipe molded to the block and in the large sizes, four or six adjacent blocks are so molded in the manufacture as to permit of the entrance of the large pipe and thus saves any cutting or chipping of the block on the construction work.

These blocks, while being particularly adapted for use in constructing storm and sanitary sewers, are also coming into use as outlet drains for large farm drainage projects instead of small open ditches. They can also be used for service tunnels as well as for highway culverts. Sewers of vitrified clay segment blocks have been constructed during the past few years in many large cities.

Both internal hydrostatic pressure and loading tests have been carried on in connection with this type of sewer and the results of these tests may be obtained from the manufacturers and testing laboratories, it being enough to state here that the strength of the blocks has proved ample and sufficient for the use to which they are put. Examinations of segment block sewers have been made after they have been in use for some time and the reports are that they are in good shape.

Burned Clay vs. Wooden Drains

The advisability of using burned clay drain-tile in preferance to wooden drains, was demonstrated recently by E. B. House, of the Colorado Agricultural College, Fort Collins, Colo., in a statement issued by him to local newspapers. Not only does the comparative price of clay tile make it the most inexpensive material to use, but its ability to withstand the effects of alkalies, which are very prevalent in western soils, is of great importance. Also the adaptability of clay tile to varying land conditions is another of the many points in its favor, for it is necessary in many cases to lay the tile on a steep hillside, and under these conditions no other material has proved so satisfactory.

Mr. House took up a discussion of the comparative efficiency of the closed and open drain, showing that, in all cases where the diameter of the tile does not exceed one foot, the closed drain is the cheaper in initial cost, and that in all cases the maintenance cost of the open drain is excessive, whereas there is no similar charge in connection with the closed drain.

"In the case of the open drain, we have conditions exactly right for the rank growth of vegetation, and the open drain, therefore, continually needs attention," says Mr. House, and goes on to state: "The closed tile drain, on the other hand, if properly installed, requires very little attention, as far as maintenance is concerned and, in the end, is cheaper than the open drain."

CLEVELAND MERCHANTS EMPHASIZE VALUE *of* WELL-PAVED STREETS

That a well-paved street—one that is free from the necessity of repairs—is a business asset is being brought to the attention of city authorities in a forceful manner by Cleveland (Ohio) merchants. A case has developed recently in that city in which certain contractors having the work of street repair in hand, have allowed this work to drag, with the result that the thorofare remained closed to traffic for an extended period of time with its accompanying inconvenience to the neighborhood. This aroused the community to such an extent that its merchants have threatened to sue the city for business they had lost because the repair work had not been finished promptly.

Linwood Avenue, Cleveland, Ohio, Paved with Brick Eleven Years Ago and Still as Good as New

Automobile dealers naturally are foremost in demanding better pavements for Cleveland, because it means larger sales for them. According to observations made by L. K. Cooper, manager of the local branch of a large automobile concern, pedestrians and vehicle traffic go out of their way in order to use a new and well-paved street. Poorly-paved sections are particularly avoided, due to the fact that it is too much trouble to pick one's way from place to place, especially in an automobile, and therefore the business in those localities suffers for the lack of good pavements.

That the constant repairing of poorly-paved streets is bound to result in tax advances and depreciation in real estate values, is getting to be a recognized fact among property owners, who are insisting on permanent paving more than ever before.

A striking example of the cost of street repairs to the taxpayers of Cleveland is to be seen in a strip of asphalt paving at the Public Square which is repaired three times a year, while Linwood avenue, shown in the accompanying illustration, paved with brick in 1905, has never given a minute's work to the repair gang.

The APPLICATION *of* EFFICIENCY *to* FACTORY MANAGEMENT

A Brief Discussion of the Scientifically Predetermined Task and a Reward for Its Accomplishment

By Dwight T. Farnham

In a Paper Read Before the Iowa Clay Products Manufacturers' Association.

OF LATE YEARS the word "Efficiency" has been very much abused. It sounds so well and it is such a convenient word that every newspaper reporter and every writer of advertisements uses it to round out his sentence, while he is waiting for the next idea to materialize. A few days ago in looking over the "Saturday Evening Post" in which the advertisements, on account of their cost, are probably written by the highest priced ad. writers in the country, I counted up twenty-six pages of advertisements. Thirty-three per cent. of these advertisements contained the word "Efficiency" or one of its immediate derivatives, applied indiscriminately to everything from motor cars to muffins.

On account of its usefulness, the word, like a good many other good things in this country of ours, has been very much over-worked. In fact, most of us have either adopted it as our own pet word which we feel exactly describes us and our way of doing things, or else we have encountered so many clever young men who have told us how efficient they were —either in person or in print—that we loathe and detest the word and all that pertains thereto.

In this wave of "Efficiency" which has swept over the country in the past ten years it has been very easy to lose sight of the fact that, to the consulting engineer, the term has a very definite and exact meaning. The efficiency of a workman or of a factory is not a matter of opinion. Instead, it is the result of a careful application of certain scientific formulae to existing conditions. The engineer, when he has finished his study and has made his calculations, is able to tell you that a certain workman is, say seventy per cent. efficient; that the workmen in that department average sixty-six and two-thirds per cent. efficient and that the proper application of certain principles will effect a saving of so many dollars a year.

SCIENTIFIC MANAGEMENT A RESULT OF PROGRESS

The application of scientific management and the principles of efficiency to industrial concerns is an outgrowth of industrial progress in this country which has taken place during the last fifteen years. The principles themselves, like most other basic truths of life, are incalculably old. We have an example of the set task in Exodus, when the task masters of Egypt were commanded by Pharaoh to lay upon the Israelites the same tale of brick but to withhold the allowance of straw. On that occasion Pharoah's men "walked out" on him just as any modern clayworkers would do if the impossible were demanded of them.

The beginnings of German efficiency are chronicled by Tacitus in the first century. He relates that it was the custom of the Teutons to sit about their banquet table and, amidst song and drink, boast of the great deeds they would do next day. Having set their tasks while they were feeling extremely brave, it was up to them to go out in the cold gray dawn of the morning after and make good. If they were successful, their victim's loot was their reward. If they failed, their penalty was "the horse laugh" from their companions. About the middle of the last century Von Moltke perfected the staff idea for the German army. The line does the fighting and the staff provides the soup and the twenty-eight centimeter guns and, to date, the staff has been pretty regularly "on the job" with both these essentials.

In the eighties the horse racing fraternity began to standardize their business. They made use of the stop watch, they standardized equipment—harness, shoes and sulkies—and they developed breeding into a science long before we ever heard of eugenics. As a result, that ideal of equine speed which prevailed when I was a boy—the two-forty gait—would be as much use to a race-horse now, as a wooden leg would be to a foot racer.

In 1911 Frederick Taylor and Harrington Emerson gave to the world, in book form, the results of their labors in industrial plants under the titles of "Scientific Management" and "Efficiency." Since then, there have been enough books written on the subject to fill a small library. These books treat of many different phases of the work and of its application to nearly every sort of industry. The great principle underlying the whole thing, however, is that of the scientifically predetermined task with a reward for its accomplishment or partial accomplishment.

A BRIEF HISTORY OF INDUSTRY IN AMERICA

In order to understand just how important an innovation this was, it is necessary to touch briefly upon the change in industrial America in the last fifty years. In about 1850 the steam engine became a factor in our industrial life. Before that, we were all more or less working for ourselves. A man was a farmer, or he kept the village tinshop or the cross roads tavern. He owned the business or he was intimately and personally associated with the owner. The "boss" was prepared to give his helpers a large amount of attention whenever necessary, as business concerns were small and employed only a few hands. Furthermore, the owner knew all about each workman, and all about his family and was prepared to praise, or to chide, or to make allowance for his employes, who were his intimates and his friends. As the steam engine came into more general use, factories grew larger and larger, until now, a mill employing a thousand workmen is a mere baby in our industrial world.

Suppose Henry Ford were to decide to spend an hour with each of his men in order to see for himself exactly what each one was doing and to inquire about the health of "his folks." If he began this month (January, 1916) and worked at it ten hours a day every day in the year, he would finish his talk with the last man some time in February, 1920. And yet a good many people want us to use exactly the same business methods our grandfathers used.

The result of the change in labor conditions is perhaps best seen by examining the two wage systems in most common use.

REAL MEANING OF THE DAY WAGE SYSTEM

The day wage system practically amounts to this:—I say to a man "I will give you a dollar and a half a day if you will come and work for me in my factory ten hours every day. If you are able to persuade my foreman that you are working hard and faithfully you can continue to work for me. If you are a poor 'bluffer' or a poor worker you'll have to go." He accepts this contract and what is the result?

1. The workers are paid for the time served, not for the amount of work done.
2. The lazy man or the systematic loafer receives as much pay as the hardworking ambitious laborer.
3. The naturally ambitious worker has no incentive to do more than his lazy neighbor and probably does less, being better able to figure out and put into effect schemes for "soldiering."
4. The foreman's usual means of determining the efficiency of his crew is their general appearance or bustle.
5. There is no incentive for the workmen to learn from each other or for the foreman to teach his men better methods, even if he knows them. The foreman is usually judged by the apparent industry of his gang.
6. Day work is a game between the foreman and his laborers. His part is to drive them into doing as much as possible, by roaring at them and by keeping ever present the fear of discharge. Their part is to retain their jobs, meantime doing as little work as possible.

Who wins? The foreman over sixty men who can give each one minute's attention out of each hour—ten minutes a day—or the workmen—each one of whom has fifty-nine minutes out of the hour unwatched—when he can conspire with his fellows to do as little work as they agree is safe? You can't blame them. You and I would do the same thing in their place.

THE PIECE WORK METHOD A FAILURE

To get away from this sort of thing, somebody invented the piece work system Theoretically, since the workman is rewarded in direct proportion to the work he does, the ambitious worker makes the maximum of which he is capable. the lazy worker is proportionately penalized and the output of the shop is maintained at the highest level; supervision is required only to maintain quality and it is to each worker's advantage to keep his machine in the best possible shape.

Actually, the whole system goes to pieces on the difficulty of setting piece rates properly. In the usual course of events it is necessary to set a new piece rate before any quantity of the article in question has been manufactured. Setting the rate, therefore, resolves itself into an argument between the "boss" and the worker, based on past records, and the final bargain is a compromise.

As the worker gains experience in making a new article he naturally cuts the time per piece—as much as he dares—and earns as much as he dares—knowing from past experience that, if his daily earnings go beyond a certain point, his rate per piece will be cut.

It is to the worker's advantage to set the rate as high as possible, so that he may earn as much as his boss will let him with the least possible effort—especially as his record on this job will be used as a basis for bargaining on the next job.

All this leads to certain subterfuges which hurt the employer and have a bad effect upon the character of the employe. If the worker discovers a quicker way to do the job he keeps it to himself. That becomes one of his reserves to draw on when the "boss" drives him to the limit. He does not spend any time inventing new tools or devices to do the work more quickly. He is willing that there should be enough break-downs so that the "boss" will have to allow for break-downs next "bargain day." He favors a slow speed and lost motion on his machine and he argues the necessity of various false motions in handling the material.

The weak are driven too fast, knowing only speed and strenuousness where, under a different system, they would be carefully taught every detail of the work, the obstacles would be removed and the workers gradually fitted to do efficient work.

The general effect of the piece work system is to place a premium on inefficiency and hypocrisy, to make for suspicion, mutual distrust and antagonism between employer and employe.

Anyone who has been in the timekeeper's room in a big factory when some piece rate worker has earned five dollars when the average earning is around three and has heard the "howl" that goes up, the immediate calling of the foreman on the carpet and the drastic investigation which takes place, will not doubt a single word of what has been said about piece rates.

The general failure of these two methods of rewarding labor has lead to all sorts of expedients. These have been successful directly in proportion to their realization of the ultimate principle—*The scientific determination of the exact amount of work a man should do under existing conditions and his reward exactly in proportion to his accomplishment.*

SCIENTIFIC MANAGEMENT HELPS THE WORKER

When the efficiency engineer has finished this work, every workman in the factory which he has been studying has been set up in business for himself. He is not a time server—paid to be present eight, nine or ten hours a day and tempted to "soldier" whenever possible by his natural rebellion against some overseer who stalks thru the plant at intervals and "bawls him out" because he doesn't *appear* busy. He is paid exactly in proportion to the work some foreman *thinks* he does. Furthermore, the amount of work he should do has been scientifically predetermined—not guessed at by some rusty foreman who learned by experience twenty years ago.

The engineer when he determines the standard—the amount of work each workman should do—has taken into consideration the exact conditions under which the workman labors; has made due allowance for fatigue on the particular sort of work; perhaps has insisted on regular rest periods and has accomplished this in such a way by the use of the stop watch and the analytical time study, that it is absolutely impossible for the workmen to deceive him as to the quantity of work which can be done under the conditions existing.

Furthermore, at the time the analytical study is made by the efficiency engineer existing conditions are bettered, materials and tools are delivered exactly as required by low-priced laborers instead of being obtained by the high-priced workman. Instructions as to methods of doing the work are then available at all times, instead of the workmen having to leave their work and hunt up the foreman for information. Delays due to break-downs of machines are reduced and everything is done to make conditions such that the workman can do the maximum quantity of work with the least fatigue in the shortest possible time.

GIVES HIM A CHANCE FOR A GREATER REWARD

Knowing that the exact amount of work he can do has been determined in such a way that attempts to deceive would be futile and that rates once set will not be cut, the workman is not afraid to let himself out and do his utmost. Furthermore, he is encouraged to do this by the bonus system of payment which allows him his day wages if for any reason he cannot make the standard set—and a liberal reward of from twenty to thirty per cent. additional if he accomplishes, or exceeds this standard.

Besides being rewarded for the quantity of work done, this reward is also strictly dependent upon the quality of work turned out. In addition, time saving and quality improving innovations on the part of the workman are encouraged and rewarded so that the workman is just as much in business for himself as the small shopkeeper or the owner of the million dollar corporation, in that his reward is directly proportional to his application, foresight and ability.

The result is that the quality of the product is improved, the cost of productive labor is decreased—often fifty per cent—output is increased, overhead is reduced and the cost of production gets down to a point where no violation of anti-trust laws is necessary in order to drive competitors from the field.

There are innumerable other phases of the work, ranging from the analysis of further investment to the scientific marketing of the product, with the application of the bonus reward for salesmen.

DELIVERIES COVERED BY SCHEDULE

The matter of deliveries is taken care of by scheduling. Every part—whether it be a part of a patent medicine or of an automobile—is scheduled from the time the customer's order is received until the goods are shipped. This scheduling covers the ordering of material, the following up of material orders, its reception at the plant, its storage, its delivery to workrooms, primary and secondary operations upon it, assembly of parts, inspection and finally its shipment. With every order in the house so scheduled, with the time of every operation known thru standardization, and with a penalty or a reward dependent upon each workman's adherence to schedule, the factory is in a position to state exactly at all times to the inquiring salesman just when delivery can be made. As a result, the salesman knows he is getting the truth, and just what will happen to him if he stretches that truth. He is benefited in the long run and the firm is benefited by an unimpeachable reputation for integrity in delivery promises.

The determination of exact costs of operation in time to be of assistance in setting the administrative policy; the organization of the executive force in such a way as to eliminate friction and work-at-cross-purposes, including the ages-old row between the selling and the operating departments which exists in nine businesses out of ten; the abolition of reduplication of work in the accounting and non-productive departments; the systematization of material and supply purchase, to enable market fluctuations to be turned to advantage; the reduction of wastes and of rejections by customers thru analysis of the causes—all these things come within the province of the efficiency engineer.

A SUCCESS IN ALL INDUSTRIES

During the past fifteen years these principles have been applied to railroads, steel mills, brick and sewer-pipe plants, logging camps, farms, hotels, department stores, paper mills, banks, knitting mills, mines, automobile factories, public service corporations city governments, and so on. There have been failures of course, but these have been due to faults of application rather than to the principles themselves. A Harvard professor who spent four years investigating what has been accomplished lays the greater part of the failures to the personality of the management and to the personality of the consulting engineer. It is necessary for the engineer to have the complete and unqualified support of those in charge and to deserve that support. Under such circumstances, there can be no failure and it is a common thing for economies amounting to a hundred thousand dollars a year to be effected in concerns employing less than four hundred men.

EASTERN PAVING BRICKMAKERS MAY SCHEDULE *their* MEETINGS

At the April meeting of the Eastern Paving Brick Manufacturers' Association, held at the Fort Pitt Hotel, Pittsburgh, Pa., the following report was read by President G. W. Greenwood:

Instead of meetings at irregular intervals, it would be greatly to our advantage to have stated meetings at regular intervals, say a meeting every two months, and on a certain day of the month, so that members could keep that date open. Committees will do more and better work if called upon every two months for a report until their work has finally been completed.

Again, a more frequent gathering together of the members will create a still better feeling, a spirit of co-operation and less of antagonism, and the interchange of much useful information concerning problems common to all, and their possible solutions.

We are still in a state where we guess at what our competitors are going to bid on a certain work, and then bid just as much lower as we deem it necessary in case we are in need of that particular work. This makes it possible for the purchaser to "play" one manufacturer against another, to the decided disadvantage of both.

Information from another manufacturer should be more reliable than information from the purchaser. This condition will not, of course, come very quickly, but repeated association in meetings will produce it in groups as suspicion and distrust evaporate, until finally the pressure of opinion will curtail, if not altogether eliminate, unfair methods of competition.

These are but a few of many advantages which will occur to you resulting merely from the frequent regular association of members one with another. Needless to state, these results will follow no matter how few may unite in these meetings. At the same time, the greater the attendance, and the larger the membership, the more advantageous it will be to all. It is a question for the association to decide if it will be better to maintain nominal annual dues and thus accumulate a surplus fund by force of numbers, or to multiply the annual dues and curtail the membership. With increasing results to the members, there will come a corresponding increase in payments, so long as the manufacturer can see that his contribution is coming back to him in definite results right at home.

There are so many things which can be done with advantage of the association, rather than by individual members, that one could scarcely take time to mention them. One subject of interest is our relation to the new

Federal Commission. From it, as an association, we can surely derive great assistance. For example, it might not be possible for each member of this association to send a representative to the Commission, or for the Commission to see all the representatives individually. But if one or more of the representatives of this association were to get in touch with the Commission, it would pave the way for continued co-operation between the two bodies, and with frequent membership meetings of our association, such as outlined above, the information so secured would be given out promptly, and discussed, with the result that new points could be suggested to be taken up with the Commission before the next meeting of the association.

The attitude of the Commission towards associations such as ours is indicated in the following paragraph from an address by Commissioner Harris recently:

"Concerns engaged in the same industry have much in common in improving processes of manufacture, standardizing products, establishing systems of accounting, obtaining credit information, and promoting the welfare of employes. By exchanging ideas you broaden your outlook of business as a whole, and your combined knowledge and experience helps to solve many difficult problems.

"Germany's success as a commercial world power is due very largely to the policy of organizing and co-operating. Her business men have worked together. They have established communities of interest among themselves for the mutual purpose of promoting trade at home and abroad. They have organized, in every important industry, trade associations and into these are gathered eighty-five per cent. of the manufacturers engaged in the respective industries. This has proved to be the very backbone of Germany's industrial and commercial achievements. More than six hundred associations of manufacturers, producers and merchants exist in Germany today, and in addition to these there are about five thousand subsidiary business organizations. The German government not only sanctions these industrial organizations but assists them in many ways."

We frequently hear of men who have accumulated some money and, instead of putting it into savings banks, they put it into clay banks, seeming to feel that any kind of a bank is a safer place in which to put their holdings. There are probably more abandoned brick yards over the country than of any other industry.

That work of the Federal Trade Commission in discouraging these enterprises which spring up like Jonah's gourd and wither in a night, but yet live long enough to cripple other plants, is indicated in the following paragraph from the same address:

"Knowledge of existing conditions will prevent others from entering the business or unprofitably investing additional capital where over-production already exists. The industry in which conditions are unsatisfactory will receive particular attention and the real cause of the conditions will be ascertained."

A recent magazine article gives Commissioner Hurley as authority for the statement that a surprisingly large number of failures result from improper accounting methods. A proper system should be like the observations of the course of a ship from which the officers determine what progress has been since the preceding day, and what course they should steer the following day.

The subject of "Cost Finding" has been before this association for the past two years, and its importance is such that it should continue to be before us for all years to come.

What the Commission has to offer on this subject is indicated by the following:

"The number of small manufacturers who have no adequate cost accounting system and who price their goods arbitrarily, is amazing. Proper accounting for the small manufacturer is most essential. It is necessary for his success that he know on what particular article he is making a fair profit and on what he is making only a narrow margin of profit or losing money. If he has this information he can concentrate on the manufacture and sale of the product on which the profits are satisfactory.

"Whole industries, in many instances, are suffering from a general lack of intelligent knowledge of cost.

"How can the Federal Trade Commission help to improve this situation? The Commission has no intention and no desire to use compulsory methods. But it does hope to reach the desired end by encouraging improvements in accounting practice, by indorsing standard systems of bookkeeping and cost accounting, and by assisting in devising standard systems, either at the request of individual merchants and manufacturers, or thru the association that represents the industry."

Still another subject to which the Commission will give its attention is that of unfair competition.

"Section two of the Clayton Act declares discrimination in price between different purchasers of commodities to be unlawful under certain conditions. This section is especially interesting to manufacturers. It does not mean that the same price must be made to all customers, but it does mean that a manufacturer or dealer shall not make low prices in the places where he has competition for the purpose of putting the competitor out of business. This kind of price cutting was one of the favorite clubs of certain powerful monopolies.

"Section five of the Federal Trade Act makes the general declaration that unfair methods of competition in commerce are unlawful, and authorizes the Commission to enforce this provision in all cases where the Commission is of the opinion that the public interest is sufficient to require action by the Federal Government.

"I would propose, therefore, that this association today designate meeting dates for the remainder of the year; that one or more representatives be chosen to visit the Federal Trade Commission and make a report at the next meeting on different phases of helpful cooperation which can be undertaken between the Commission and our association."

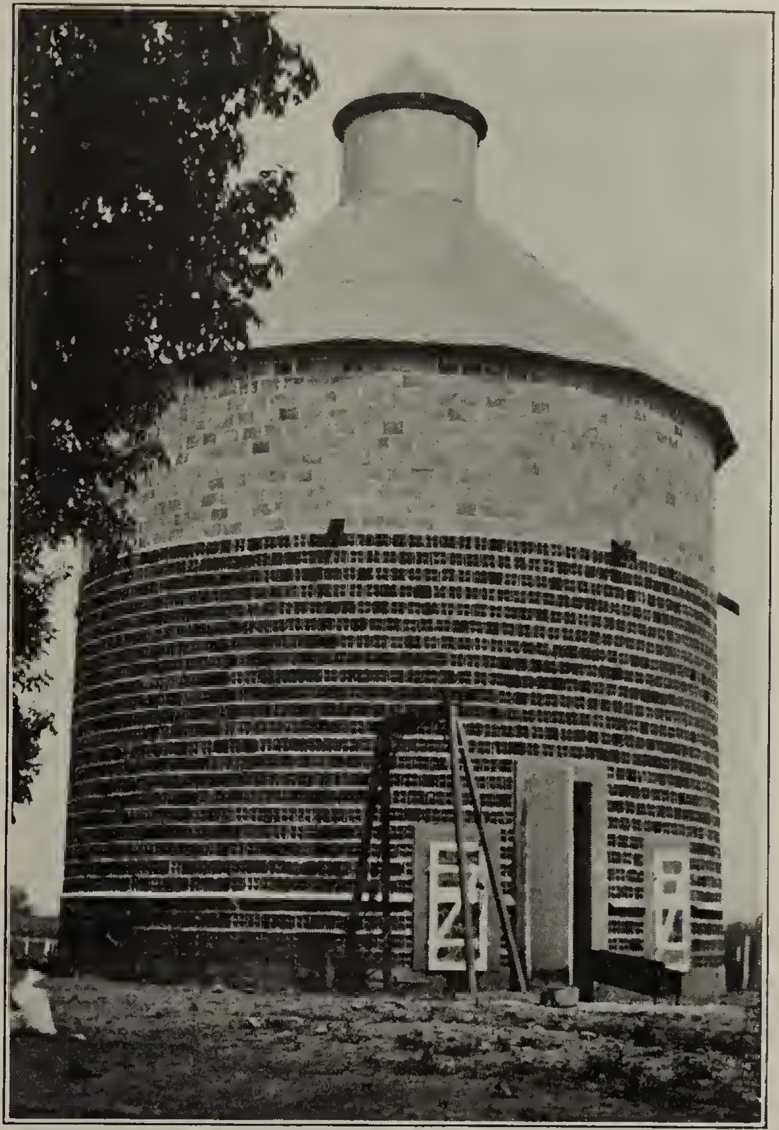
Brick Company Buys Babylonian Tablets

To show the earlier uses of burned clay, and to possess evidence of historical value proving the permanence of that material, the Diamond Fire Brick Company, of Canon City, Colo., thru Harry Bowen, has purchased sixteen clay tablets that have been uncovered in the ruins of Babylon and other ancient cities. These tablets are all dated from 2400 to 500 B. C., and despite their ancient origin, the writing upon their surfaces is quite visible, altho unintelligible to the layman not conversant with that style of script.

According to H. J. Crowe, salesmanager of the Denny-Renton Clay and Coal Company, Seattle, Wash., and now resident sales agent in Tacoma, all sales in the southwest section of the state will be handled by the Tacoma office, due to the shipping advantages by water and rail at that point.

FROM RAILS *to* RAT-PROOF

A Story Concerning the Evolution of the Corn Crib, Which Originally Appeared in the "Farming Business." The Following Article Was Written by the Editor of This Magazine, as a Part of Its Work in Conveying the Message of Burned Clay to Those Who Can Profit Most by Heeding Its Call



Defying Ravaging Rodents, and Even Time in its Flight, This Eleven Thousand Bushel Combined Crib and Granary Is the Last Word in Corn Crib Construction

MAN CAME FROM MONKEY—so scientists tell us. Without going into a discussion of the merits of this statement, suffice it to say that, wide as the difference is in this theory between the raw material and the finished product—present day man—the contrast is hardly less marked in the development of the corn crib from its origin to now.

Abraham Lincoln and split rails are almost inseparable. The earliest type of corn crib was made by piling long, crude sticks of wood, the product of a split tree trunk, one above the other, tied in at the corners to form a rectangular bin with very open sides, as shown in an accompanying illustration. There is little doubt but that this method of curing corn was in vogue when Lincoln stirred the Middle West with his plain eloquence and quick wit during the early days of his political career, considerably more than a half century ago.

The rail corn crib has a glorious and historic past—of pioneer days when brave men and women set out to conquer stubborn wooded lands and to harness the wonderful possibilities of the prairies. But the rail crib has outlived its usefulness. It is nothing but a memory except in a few hidden nooks where some farmer, unwilling to drop the old for the new and better way, still persists in being a "good fellow" to the rats and in allowing a large percentage of his crop to mold in an ancient receptacle.

The frame crib has long since succeeded the split rail crib on most farms in the corn belt. It is by far the most numerous of all types of a corn container. There are many excellent examples of good frame corn cribs to be found all over the United States, and there are many poor ones.

The trouble has been that, in the past when corn was selling for from twelve to fifteen cents a bushel, and the price of lumber was high, no one seemed to be very particular about the kind of crib he had or built. Second-

The Pioneer Corn Crib. Made of Split Rails Piled One Above the Other. It Has Many Historic Associations and Stirring Memories.

As If to Speed the Parting Guest, a Clay Block Crib—Not Shown in the Picture—Stands to the Right of This Old Frame Corn Crib Now in the 'Last Stages of Decay

hand boards and inferior lumber "slapped up" in a careless and hurried manner seemed to constitute a "good enough" place in which to put the corn. Little difference did it make when the feed was covered with snow in winter or became wet with the rains of autumn. How much the rats ate gave small cause for concern. Corn was cheap anyhow.

But now, look what a change. Corn has advanced from a shilling to as high as seventy cents a bushel and who knows to what heights it may yet soar within the next few years. Now the trouble is that most farmers, with the careless habits of former years, with regard to the storing of corn, firmly fixed in their minds, are liable to cause themselves considerable loss by not properly caring for this high-priced corn. There is little profit in plowing, harrowing, selecting and testing seed, planting, cultivating and husking if the farmer does not have a crib that does justice to the corn which he raises.

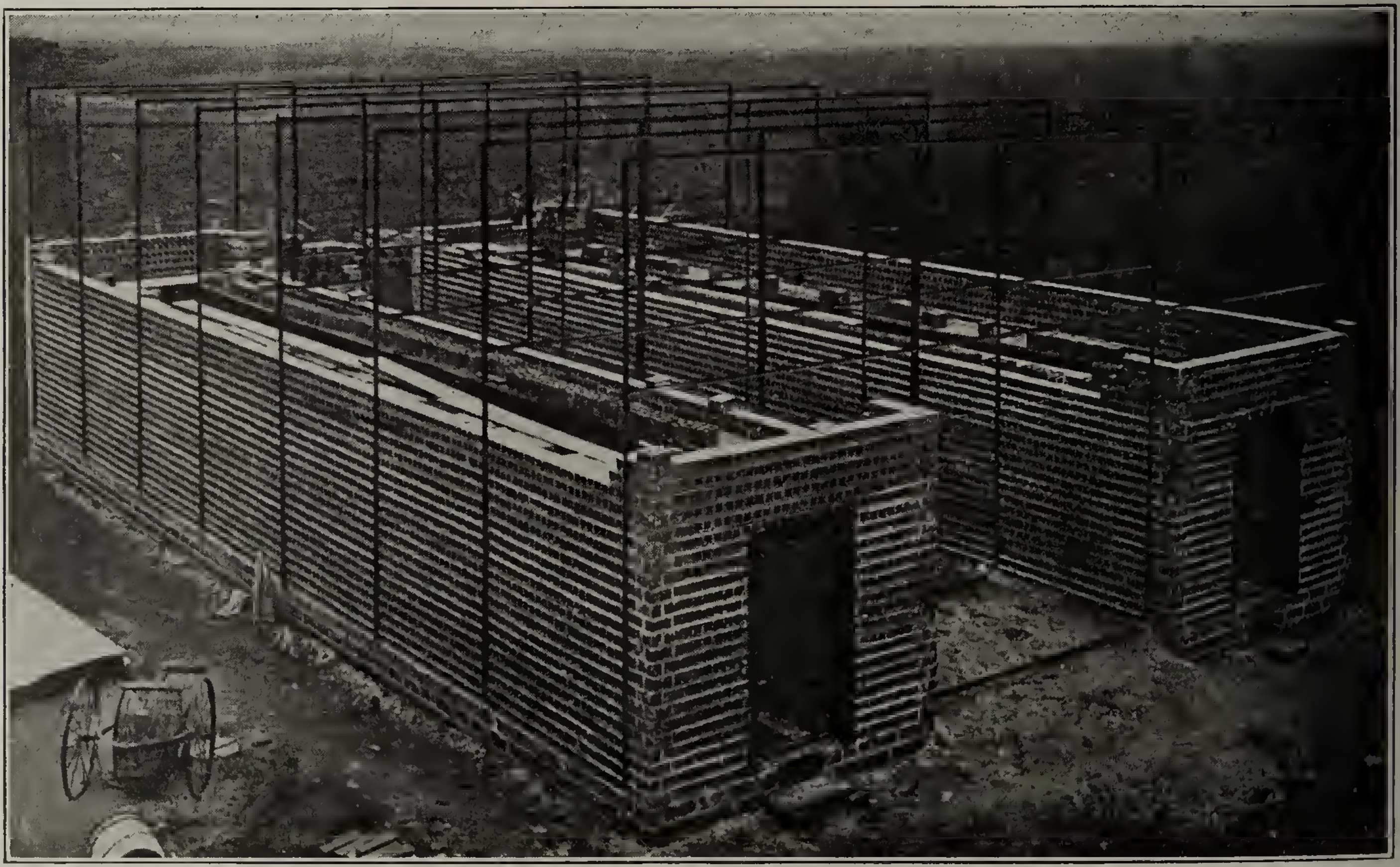
Following upon the heels of demand has come a new type of crib that supplants the wasteful frame crib, its predecessor. This crib is permanent, fireproof, economical in arrangement, low in cost and pleasing in appearance. It saves every kernel of corn, since it is rat and moisture-proof, and its cost of upkeep is practically nothing.

In building a crib of this sort, a concrete foundation is first laid eight inches in thickness and to a depth of about three feet in the ground. A one-to-four or one-to-five mixture is used for this work, the foundation being laid in a circular form since most of these cribs are round. On the foundation is laid hollow clay building tile, each unit usually measuring 8 by 8 by 8 inches. Each of these blocks has four holes and is not in the shape of a cube, as most hollow-tile we have seen, but is cut on a quarter slope so that, when laid in the wall, the cores slope downward, instead of being vertical. This shape has been adopted so that the open walls might shed the water and snow and so keep the corn dry, while admitting plenty of air.

Between each course of blocks in the wall, three ¼-inch wires are placed as reinforcement for the walls and to prevent their bursting when the crib is heavily loaded. The wires are imbedded in the mortar and in this way are kept from rusting.

The floor of the hollow-tile corn crib is usually built of concrete with drain-tile or 5 by 8 by 12-inch hollow-tile laid flat, placed between the gravel sub-base and the floor proper. These tile are placed in this manner to keep the floor absolutely dry, as it is a well-known fact that solid masonry has a tendency to become cold and condense moisture. However, with the aeration, as provided for in most of these cribs, this objection has been eliminated.

In order to keep the rats from crawling thru the cores of the blocks and thus entering the crib—for this is the only way in which they can gain admission, the walls and foundation being rather hard on their teeth—wire screening is placed around the inside of the crib for a distance of about three or four courses from the floor. Then, on the outside of the building, a galvanized-iron ledge is placed at the point where the wire screening ends on the inside. The ledge projects about four inches from the surface of the wall and is bent down slightly at the edge, making it absolutely impossible for a rat to climb around it. The bent-down edge also protects the stock from



A Double Crib Built of 5x8x12-Inch Hollow-Tile and Located Near Moorland, Ia. The Cost of This Type of Corn Container Is Almost Identical with a Wooden Structure of the Same Capacity being cut on the legs should they run against the ledge.

The roofs on these hollow-tile corn cribs are usually built by nailing 2 by 6 rafters to a double 2 by 8-inch plate which is bolted to the top of the tile wall. These rafters are supported in the center of the building by posts which project upward from the ventilating core walls. A three-foot minimum should be observed in fastening the rafters at the outside walls, best practice dictating this construction. When all of the rafters have been spiked to the plates, pieces should be nailed in at intervals of six feet, starting at the lower end and running upward. One by four sheeting is then nailed on and the shingles applied.

An interesting feature of the hollow-tile corn crib is the ventilating core which is placed in the center of the building and extends thru the top of the roof. This core exerts a "pull" or draft much the same as a chimney, drawing the air thru the outer walls of the building to the corn. After passing thru the contents of the crib, the air goes out of the building thru the core. The corn in this way is thoroly dried and kept dry.

In filling a crib of this kind a small elevator terminating at the top of the core and operated by a small gasoline engine, will be found entirely satisfactory. In most of these cribs, a spreading cone, built in connection with the core, distributes the corn evenly in the crib. A shelling trench may be built in the floor, usually eighteen inches wide and eighteen inches deep, to lighten the task of shelling. A conveyer belt, running in this trench, carries the ear corn out to the sheller at a considerable saving of labor. In this way, one man can feed more corn to the sheller than can be handled. The walls of these trenches, in most cases, are built of concrete, altho hollow-tile may be used, thereby eliminating the necessity of building expensive forms.

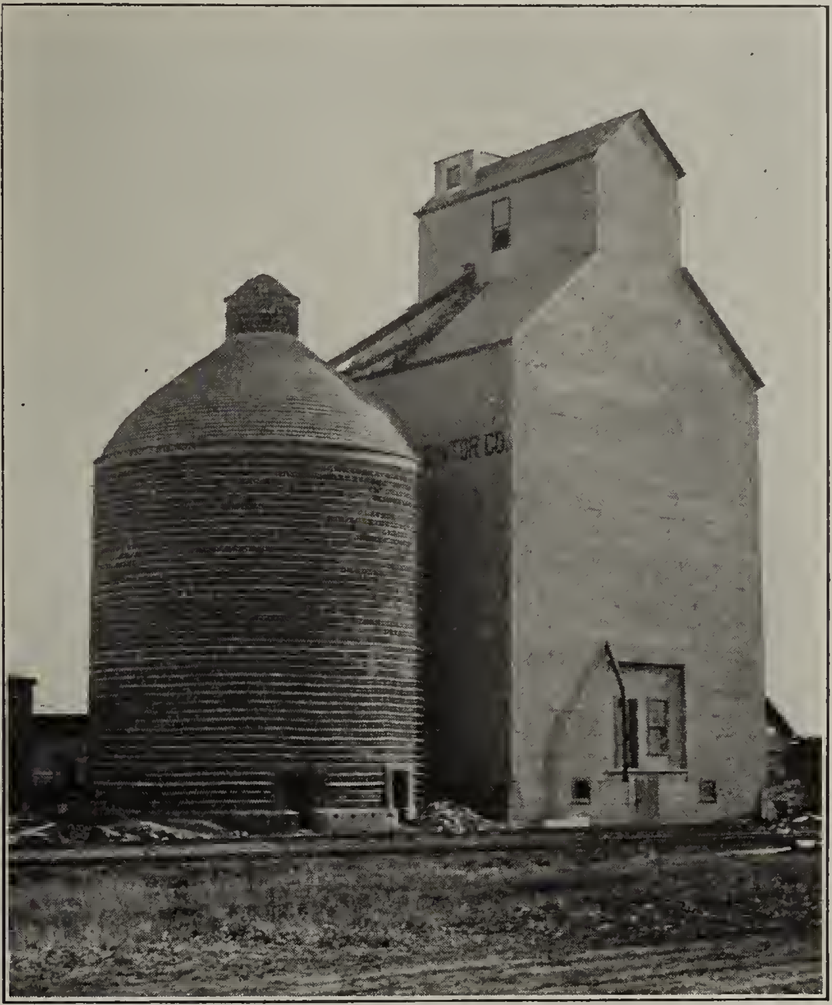
A round, hollow-tile crib located on a farm near Auburn, Iowa, has a capacity of eight thousand bushels and cost $1,500. It has a self-supporting tile roof, which makes the structure entirely fireproof. This crib is twenty-five feet in diameter and measures twenty feet to the eaves. It has a six-foot ventilating core and the space in which the corn is stored is nine and one-half feet in thickness around the crib.

A radically different type of tile crib is shown in another of the accompanying illustrations. It is rectangular in shape and is commonly known as the double crib, with a driveway dividing the structure into two parts. It is located near Moorland, Iowa, is thirty feet wide and fifty feet long and has a capacity of about 12,000 bushels of grain—6,500 bushels of ear corn and about 5,500 bushels of oats.

It will be noted that a skeleton of steel work extends above the finished portion of the crib. In explanation, it might be said that these are reinforcing angle irons which are left permanently on the crib after it is finished to insure against its bursting when filled. The vertical irons are tied at the top and at the bottom and at two or three points between, these latter tie-bars extending thru the corn. At the ends of the crib, channel steel door frames are used which makes them exceedingly strong.

The material for this crib, including the roof, cost $1,100 and the cost of the labor was about $300, bringing the total cost up to approximately $1,400. Four by eight by twelve-inch vitrified crib blocks were used in the construction of this crib, which, it is needless to say, will last for a good many generations.

With regard to the cost of a crib of this type as compared with one built of wood, it is interesting to note some figures which were produced in connection with the building of a rectangular crib at another point. In figuring the cost of a 7,000 bushel crib at Lundgren, Iowa, it was found that it cost only $10 more to build it with clay blocks than in wood.



A Mammoth Hollow-Tile Crib of the Round Type Which Measures Thirty-Two Feet to the Eaves. This Crib Has a Capacity of Ten Thousand Bushels of Corn and Is Owned by the Farmers' Elevator Company at Yale, Ia.

The cost of the round tile cribs are also very favorable when compared to a frame crib. With a non-fire-resistant roof this type of corn container costs from eighteen cents per bushel of capacity in a 2,000 bushel crib to fourteen cents per bushel of capacity in a 10,000 bushel crib. This includes a structure erected and complete, ready for the elevator. Round cribs have been built with driveways, and combined granaries have been used in several different ways with entire satisfaction. In one instance a crib was built which measured thirty-two feet to the eaves.

In spite of the fact that the round structure is a radical departure from the time-honored system of building cribs, there are more than 1,000,000 bushels in capacity of tile cribs of this type in service in the state of Iowa alone.

You Can Make the Farmer One of Your Best Customers

by studying his needs and then showing him how to use your product so as to meet his requirements for low-cost, permanent and fireproof buildings.

TIME TEMPERATURE CURVES *during the salting of some* OIL-FIRED SEWER-PIPE KILNS

In Which is Described Some Experiments in Glazing Made on a California Sewer-Pipe Plant

By F. H. Riddle and A. L. Gladding

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THE SALTING OF SEWER PIPE, no matter where or under what conditions, seems to be accompanied with more or less uncertainty. Two of the essentials for successful salting are sufficient heat to volatilize the salt when the ware is properly burned, and the proper draft. Both are equally important. If the ware being salted is slow to take the glaze, as is the case of most No. 2 fire-clay bodies, the problem of maintaining the proper temperature in the fire boxes sometimes becomes troublesome. The vaporizing of salt is an endothermic reaction, and the general belief seems to be that the loss of heat, after continued salting, is due to this reaction alone.

A customary procedure in salting is the use of a reducing atmosphere. There seems to be various opinions as to the necessity of this. Regardless of whether or not this is a benefit from a chemical standpoint, it is of assistance from a commercial standpoint, more especially with a light burning or buff colored body. A pipe having a thick glaze will sell regardless of color, while with a thin glaze or a flash, it will not sell. The darker the color, the more nearly the piece will look like the better glazed ware. Therefore the more reduction the better, so long as the body is not smoked until weakened, as can easily be done with some clays.

While the glazing requires considerable time, as in the case under study, the maintaining of the salting temperature is of considerable importance. Where coal is the fuel, and the

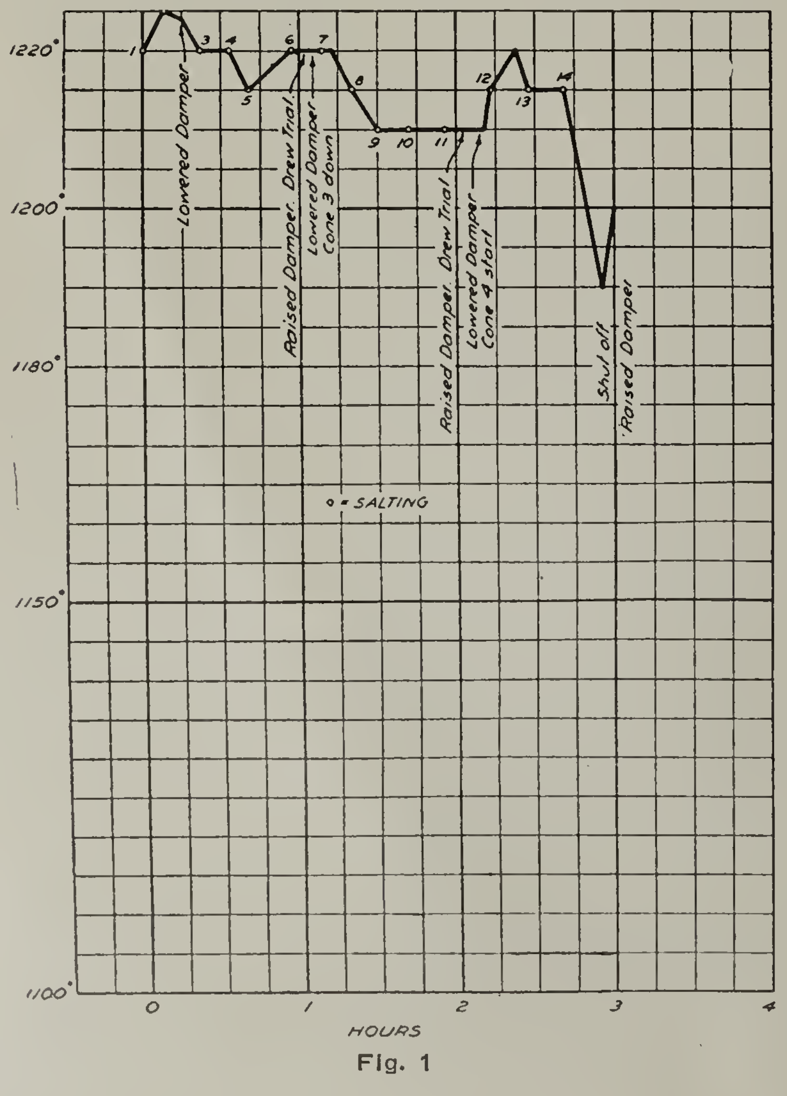


Fig. 1

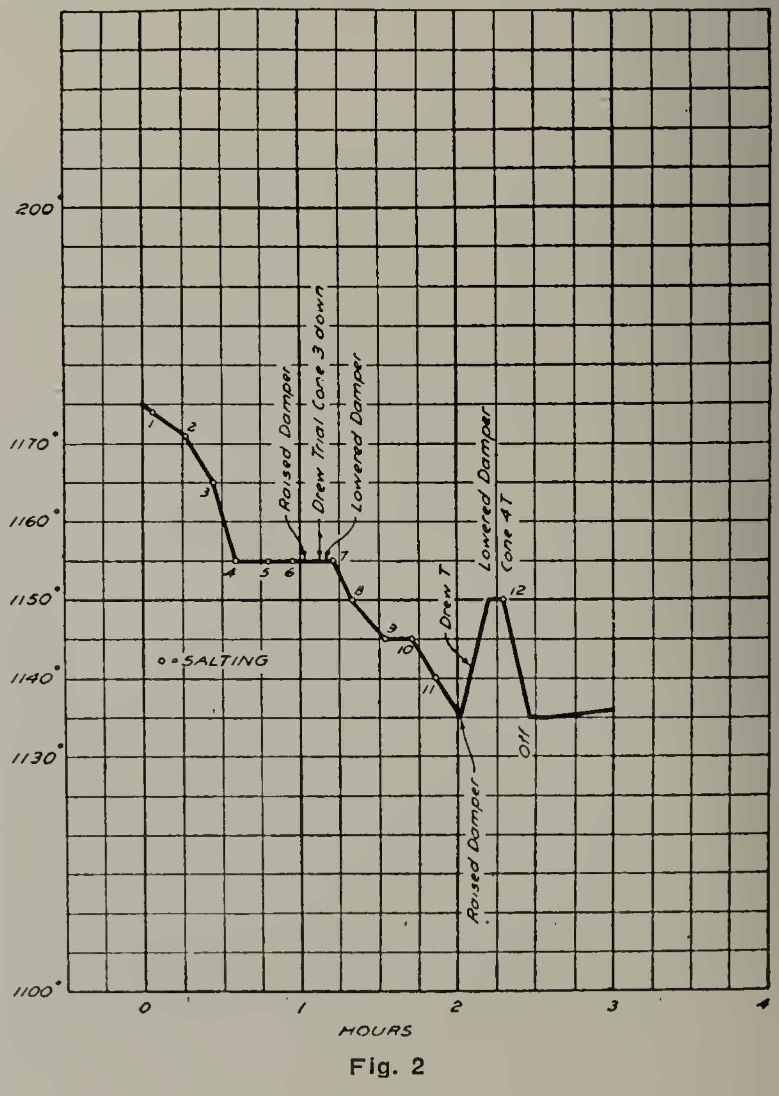


Fig. 2

firing is intermittent, the problem is more difficult than where oil is used, since the oil can be fed continuously regardless of the salting. In overcoming this loss of heat, the question to consider is, what causes it? Is it entirely due to the salting, or are there other causes? The writers believe that there are other causes, as well as the salting, at least in the case under discussion in these notes.

A brief description of the local conditions will be of assistance in studying the accompanying figures. The kilns are the ordinary type of round, down-draft kilns with checkered floors. The bottoms have a center well hole, with radial flues leading out to points at the side wall midway between the bags. Each of these radial flues has three properly spaced inlets to take the gases from the feather flues above. The inside diameters of the kilns are thirty and thirty-six feet. Both sizes salt equally well. The number of fire holes in each kiln varies, there being ten or twelve, depending on the diameter. The fire holes are 20 inches to 24 inches wide and from 3 to 4 feet high. None of these variations seem to affect the working conditions to a noticeable extent.

The fuel oil, which is commonly used in California, contains about 18,500 B. T. U.'s, and is supplied to the kilns under pressure. This pressure is of little consequence so long as it is constant, and great enough to furnish the volume required. The atomizing agent is air, at a pressure of about 25 pounds to the square inch, at the tank. This will be considerably lower at the burners. The air pressure is of great importance, and is determined by the pressure at which the burner will atomize. The lower the pressure, the better, since the cost of compressing the air is reduced, and the action of the fire on the kiln arches will be less severe. Too low a pressure will not atomize the oil sufficiently to make good combustion, and will not raise heat fast enough. There are so many burners on the market, and so many home-made ones which apparently do equally well, that no description seems necessary. We would like to state, however, that the air and oil first come in contact with each other after they leave the tip of the burner.

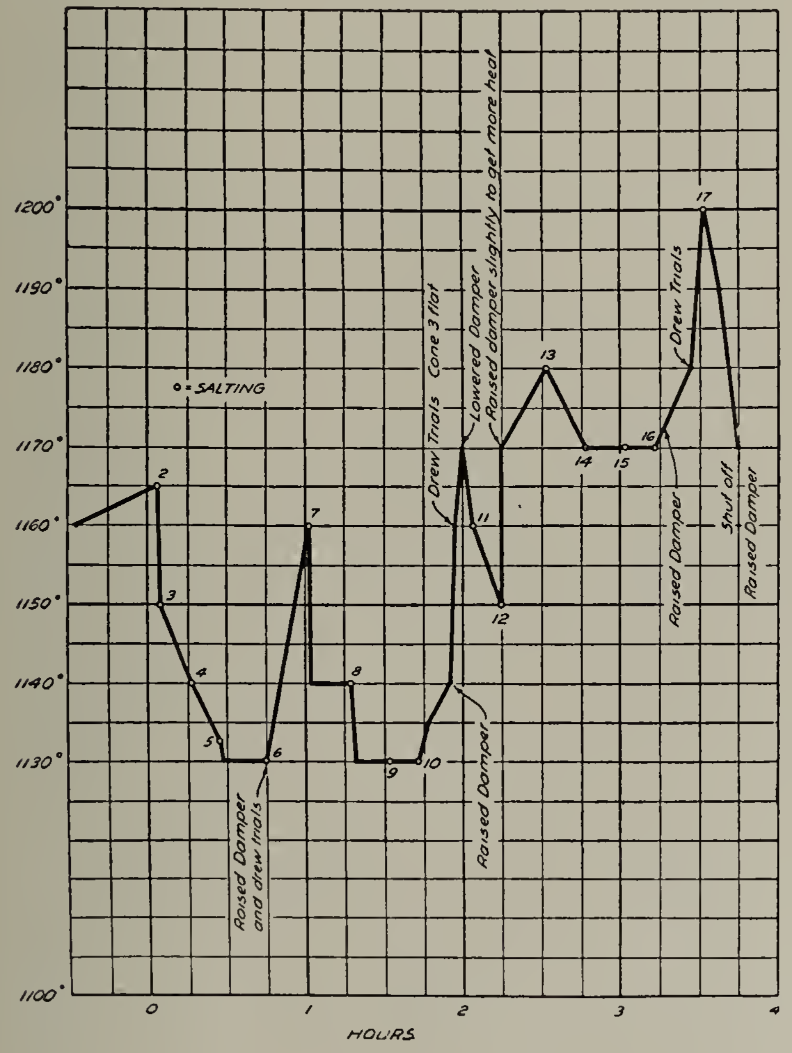


Fig. 3

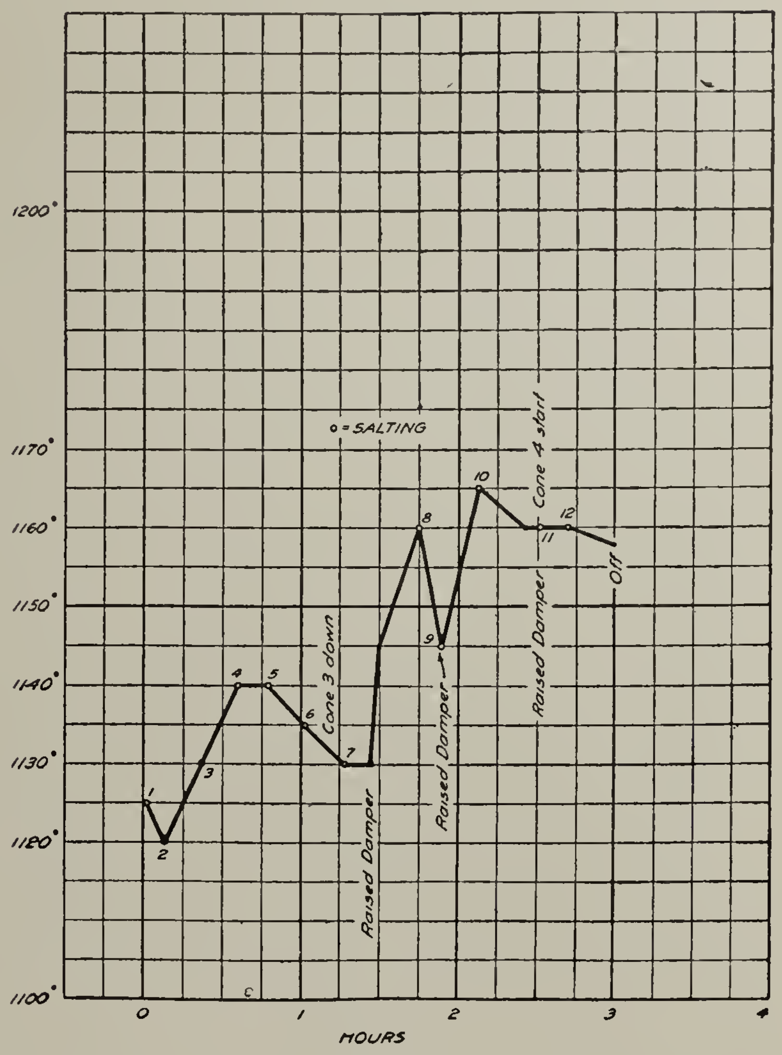


Fig. 4

The fire boxes in the kilns were arranged with the burners about eighteen inches from bottom, horizontal, and the tips flush with the face of the kiln. The fronts of the boxes were built up with a four-inch wall of brick, allowing a six-inch square opening around the burner, and an opening the full width of the box extending down from the top ten inches. These top openings were filled in with loose brick until time to salt, when they were taken out, so the salt could be thrown in.

The arrangement described above was used on all kilns but the one as shown in Fig. 4. Here a rectangular opening was used, of dimensions one brick wide (nine inches) and three brick high (eight inches). At the center of this opening, on the bottom was a smaller opening three inches wide and four inches deep. The burner was set into this opening about an inch and as near the top as possible. The burner was eighteen inches from the bottom of the box, and the opening properly made around it. The eight-inch and nine-inch opening above the burner could be stopped by putting three brick in it. The front was bricked up to the arch, with the exception of an opening at the top about the size of the end of a brick, which was used as an inlet for cold air to relieve the arch when too hot.

In the second case, the salting was done thru the hole above the burner, the three loose brick being removed to do this. In both cases the salting openings were left open thru the salting process. At this stage, the kilns are dampered so low that there is very little chance for any cold air to get in.

The body, a No. 2 fire-clay mixture, requires considerable time to take the glaze, and is considered a hard body to glaze. The usual procedure with the ware is as follows: When the proper cone has gone down (cone 2) the damper is lowered until the draft is practically balanced. This can be determined by opening the peep hole in the center of the wicket. If the draft is right, the gases and flame will lazily issue from the hole.

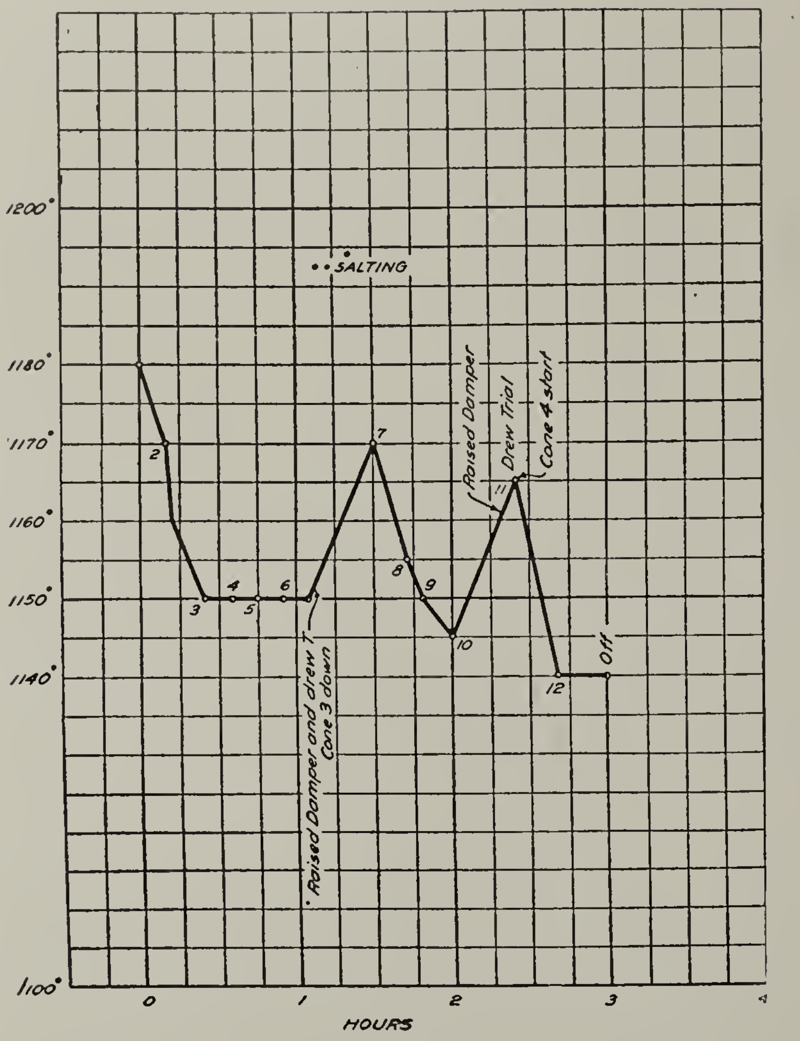


Fig. 5

The salting is done at approximately twelve minute intervals, and a shovelful of salt is thrown in each box at each salting. The interval is lengthened when trials are drawn, as the damper has to be raised, and the kiln cleared up to see the cones and to draw the trials. This is done three times during the salting unless the kiln is irregular in some way. The time of salting is usually about three hours, and the kiln is salted about twelve to fourteen times during the process. The last trial is usually drawn at the end of the salting period and does not show on the figures. If the ware shows only a flash, when the first trial is drawn, it indicates that the draft is too strong, and the damper is lowered slightly. This adjustment will usually make the glaze take hold, if the heat is right. When the salting is completed, the damper is raised, and the salt holes are left open from four to six hours to clear the kiln, and produce a bright glaze.

The accompanying figures show one curve for an entire burn, and the detail for salting on eight burns. The pyrometers used in taking the readings were the regular kiln equipment consisting of twenty-four inch platinum, platinum-rhodium thermo-couples placed about two feet away from the kiln crown hole and encased in porcelain tubes projected by an outer three inch fire clay tube. The couple projects into the kiln about four inches. The cones are placed one pipe high, near the wickets.

The chief things to note on the figures are, that in nearly every case there is a loss of heat during the salting. This varies from 50 deg. C. to 15 deg. C., the average loss being about 30 deg. Figures 3 and 4 are special cases and are not included in the determination of the average loss.

One will notice that, altho there is a loss over the whole period, there are stages where very sudden rises in temperature occur. In every case but Fig. 4, these rises occur directly after the damper has been raised to clear the kiln to draw trials, and the temperature stays up until the damper is lowered again. On most of the curves you will notice that a charge of salt is put in immediately after the damper is lowered again. This makes it appear that the salting has as much to do with the subsequent loss of temperature as has the lowering of the damper, and the resulting reducing conditions due to cutting down the air supply.

The following, however, would make it appear that the lowering of the damper had more to do with the drop of temperature than had the salting. Figure 2 shows a gradual loss of heat after the second salting. Note how this decline is accelerated at the point where the damper is lowered. It might be well to mention here that, as a rule, the first two or three saltings are done before the damper is lowered to the proper point. Note the effect of lowering the damper, as shown on Fig. 3, at the end of the second hour. Also note the two or three cases where salting was started before the damper was lowered, and that the heat continued to rise until the damper was lowered. See Figures 1, 6 and 8.

Figure 3 represents a burn in which there was trouble, and the ware did not take the glaze. It seemed advisable, after the second trial was taken, to raise the heat. This was done, as shown, fifteen minutes after the second hour, by raising the damper. It required extra salting to get the glaze, probably because the ware was not hot enough at the start to take the glaze properly.

Figure 4 is entirely different from any of the other curves. Here, the temperature increases from the beginning to the end of the salting, and in several cases, immediately after the salting. The reason for this is the change in fire box fronts, as previously described. The boxes were arranged with smaller salting holes and lower down in the fire box fronts. The results of this change warrants a further study under the same conditions. It is hoped that the results of these continued experiments can be described later.

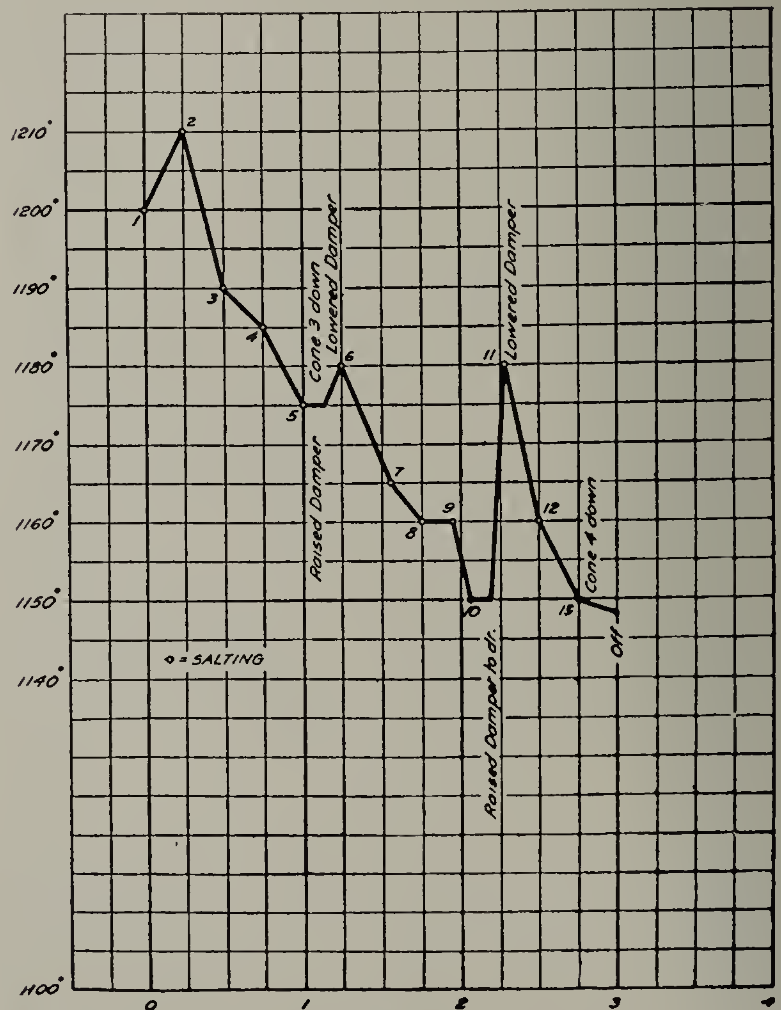


Fig. 6

The general conclusions to be drawn from the experiments so far obtained are not definite. The indications are that the reducing conditions have as much effect as the salt, or even more, in causing fall in temperature. The reducing conditions are caused by the lowering of the damper and the resulting decrease in air supply.

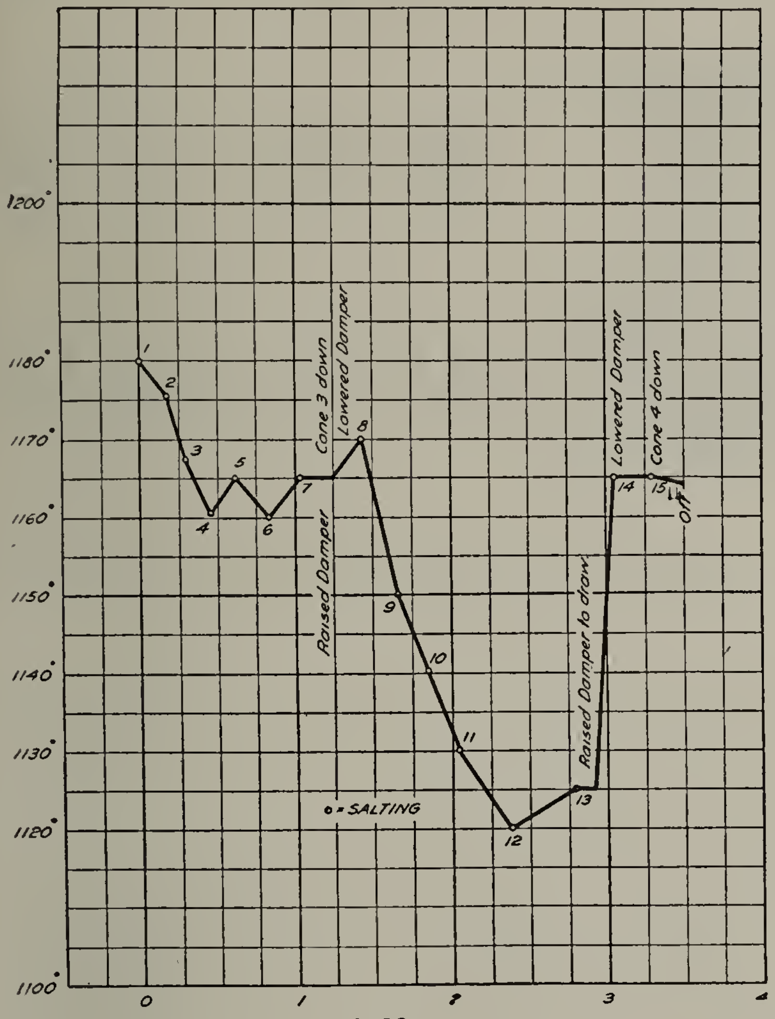


Fig. 7

It is hoped that discussion from those interested will cover the following points, viz.:

First, the effect on salt glaze (brightness of glaze, causes, etc.) of rapid cooling directly after finishing, the cooling not being continued to a point where the pipe are in danger. Second, crude oil burners. The effect and advisability of mixing the oil and atomizing agent after leaving the tip as compared with the mixing in the burner.

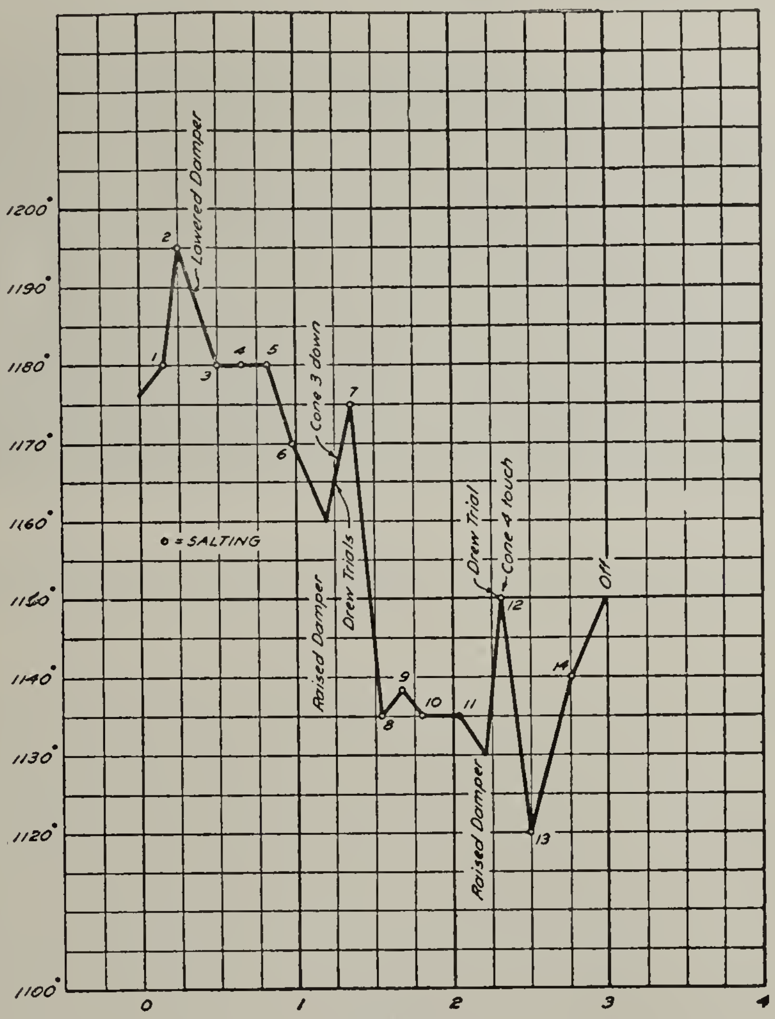


Fig. 8

Final Drain Tile Specifications Drafted

Meeting on Friday and Saturday, April 28 and 29, at the Congress Hotel, Chicago, Ill., committee C-6 of the American Society for Testing Materials made the final draft of the standard specifications for drain-tile which will be advocated by that organization. These specifications will include strength and absorption tests, and in some cases, freezing and thawing tests.

An enormous amount of time and energy has been expended by the members of this committee, extending over a period of years. Each member has donated his time and energy to the successful culmination of this work, paying all of his own expenses, there being no fee of any sort earned.

The committee consists of sixteen members, including three active producers from the clayworking industry, three from the cement industry and ten non-producers.

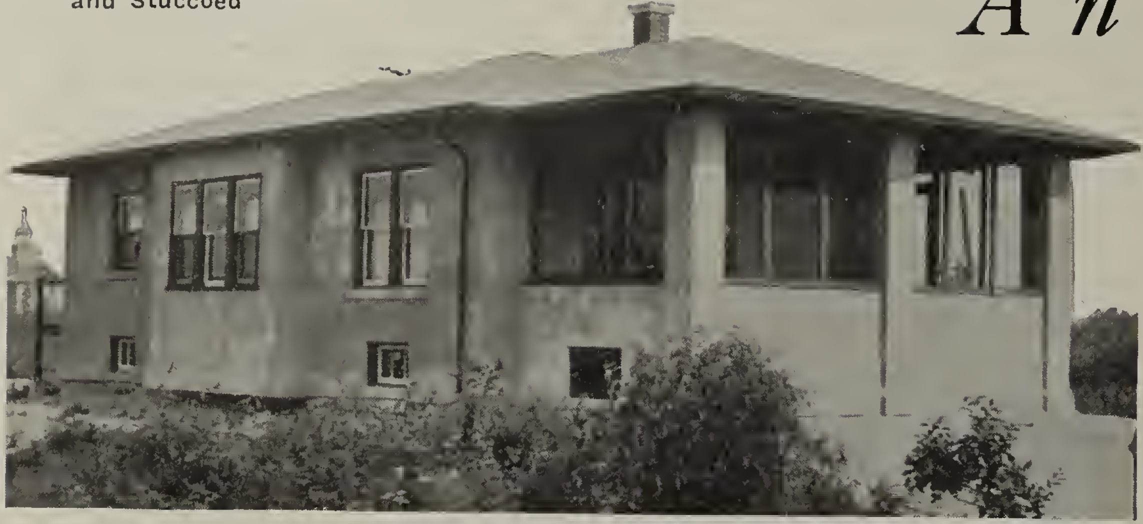
Those representing burned clay drain-tile manufacturers were: J. Leo Childs of Findlay, Ohio; Benjamin Brooks, Kansas City, Mo.; and Charles Rawson of Des Moines, Ia.

The non-producers who were present at this meeting were: Dean A. Marston (chairman), Iowa State College, Ames; Prof. Edward Orton, Jr., Ohio State University; Prof. Talbott of the University of Illinois; Prof. Stewart of the University of Wisconsin; Mr. Frontier of the United States Department of Agriculture and Prof. Furneure of the University of Wisconsin.

A new draft of the final specifications will be made and the society will then take action on the committee's report at the next annual meeting in June of this year. The report will be printed in the next (1916) issue of the transactions of the American Society for Testing Materials.

Changes in Official Family of Kentucky Concern

Beginning with June 1 James T. Howington, formerly of Nashville, Tenn., and for the past three months sales-manager of the Coral Ridge Clay Products Company, will assume the duties of general manager of that company, succeeding George H. Fiedler, who retires. The announcement of this change in the official family of this young and healthy organization was made recently at the company's offices, 1915 Inter-Southern building, by Mr. Fiedler. Mr. Howington, a graduate of Vanderbilt University, at Nashville, where he equipped himself as a construction engineer, was in the general contracting business since his graduation in 1907 until he came to the Coral Ridge Company. Mr. Howington has made many friends in Louisville since he joined the company and they are predicting that he will manage the business successfully. Mr. Fiedler, who came to Louisville from Chicago and saw the Coral Ridge Company thru the period when it was building its plant, will go for a time to Georgia where he has various interests and may later locate in Chicago. In the future he will devote his attention to his personal interest.



The "Nest" After It Was Completed and Stuccoed

An IDEAL BUILT HOLLOW

A Story of Cupid and Homebuilding, Republished from the "Building Age" in Which

MARY AND JOHN are about to embark on the matrimonial seas. They have been planning for weeks, yes months, the details of their future paradise, but there is one question which they have not as yet been able to answer to their satisfaction and which has caused them considerable anxiety—where shall we live? Mary is opposed to entering upon her duties as a housewife in a "two by four" flat, while John, who is an ambitious fellow having saved thru his industry a small amount of money, would like nothing better than to build a home in which he and Mary could begin their partnership. But his capital is small and he has high ideals. He would not build a "cheap" home—he would rather rent a place than do that—yet he would build if he could find a design and construction that would give him a substantially built home with modern conveniences at a low cost.

Did they realize their ambitions—Mary and John? The accompanying illustrations of a bungalow tell the story. They did, and in so doing, have blazed the path to a well-built, low-cost home, a house such as many would like to build if they only knew it were possible with the money at their disposal. And so, in order that some may learn of this fact and that those who can profit by the erection of these homes may have something tangible to show a prospective builder of a low-cost home, the following description and plans are given.

The bungalow shown herewith was built in Hammond, Ind., a town adjoining, in fact, almost a suburb of Chicago, the architect being Karl D. Norris of East Chicago, Ind. It has masonry walls, of attractive design, well built, fireproof and has a well finished interior and exterior. The main part of the building, not including the porches, is 26 ft. wide and 37½ ft. long, measuring 12 ft. from the grade line to the eaves.

The foundation is composed of conduit "seconds," a material that was originally intended to house telephone or telegraph wires, but which, because of some minor defect such as a slight imperfection in the glaze or a nick out of one end, were rejected at the manufacturer's yard by the buyer's inspector. These conduits are made of fire-clay, vitrified in a kiln at a high temperature and are amply strong to carry the load imposed upon them in a building of one or even two stories. They may be obtained very cheaply and make an excellent foundation, thoroly waterproof. These conduits, eight inches in thickness, were laid up with cement mortar on concrete footings, and upon them were placed the walls of the building which are composed of eight-inch hollow clay building tile.

When finished these walls were covered with a coat of rough-cast stucco which was applied directly to the surface of the tile. The exposed woodwork on the exterior of the house has been painted a rich brown, and this, together with the rough gray of the stucco, the green roof and the red brick chimney, form a most pleasing color combination.

The interior of the house is taken up by a living room, dining room, kitchen, bath and two bedrooms. The entrance to the house is thru a vestibule which has a large window in the south wall, while opposite the door is a closet for hanging coats and wraps. From the vestibule, access may be had to the living room which extends very nearly the entire width of the house. The floor of this room is oak as is also the trim, which is continuous; that is, it consists of a broad band of oak placed at the proper distance from the ceiling and extending in one seemingly continuous strip around the entire room. In a niche at the south end of the room is a built-in bookcase of oak. The plastered walls in this, as in all of the other rooms, have a sand float finish, the plaster being applied directly to the surface of the tile on all of the outside walls. The interior partitions were built of studding and wood lath. The electric light fixtures in the

A View of a Corner of the Basement Showing the Foundation

"NEST" WITH TILE

How It Looked in the Course of Construction

a Hollow Tile Bungalow Is Erected at a Cost of Less Than Three Thousand Dollars

living room are of brass, very simple and plain, but serviceable.

A colonnade separates the living from the dining room, the most striking feature of the latter being its well-lit interior which is due to the fact that this room has a bay on the north side with three windows in it. Unlike the living room, the floors in the dining room are of white pine, but so well has the painter done his work that the difference can only be seen by the trained eye. The floors match perfectly in the doorway between both rooms. In the dining room an inverted light fixture hangs from an elliptical, imitation-beamed ceiling. The trim is of oak, the walls below the plate rail being paneled with strips of the same material.

The kitchen is separated from the dining room by a swinging door. The floor in this, as well as the bedrooms, is of white pine, well laid and without blemish. The trim is also of pine, the wall below the chair rail being painted in ochre while above it is white. This kitchen has many conveniences, notable among which is a small door in the east wall opening onto the back porch thru which the ice may be placed in the box without the necessity of the iceman coming into the kitchen. Opening onto the back porch, and immediately at the head of the stairs, may be found a built-in chamber for housing the garbage can. We hear so much about "swat-the-fly" campaigns, but here is an instance where the fly has been put to rout without the beating of drums and the blaring of trumpets. This chamber is thoroly sanitary, being lined with white enameled sheet iron. It also has a cast-iron door which may be shut tight at all times, a most welcome provision for hot summer weather.

Next to the kitchen is the bath room, which is a surprise to all who visit this home. Considering the total cost of the building, this room is a marvel of conveniences and finish. The floor is laid in mosaic tile, while the walls are plastered, that part below the chair rail being marked off in imitation tile. Above the chair rail, the walls are enameled white over a sand float finished plaster wall, the woodwork also being enameled white. The plumbing fixtures are modern in every respect, the most notable feature being a shower bath. In the west wall and next to the floor, is a clothes chute leading to the basement thru which all soiled clothing may be thrust to a receptacle below where they will be ready for the attention of the housewife and her helper, thus eliminating many steps and the carrying of a cumbersome basket or bag to the basement on washday.

The bedrooms, of which there are two, are located on the south side of the building. The floors are of white pine, well laid, stained and varnished. The larger bedroom has a double window while the smaller back room has one window in both its north and south walls. Between the bedrooms is located the stairway to the basement.

Nor has the basement been neglected in the planning of this model home. With a well-drained cement floor, electric lights and stationary tubs it compares well with the rest of the house in convenient arrangement. Here is also located the hot-air furnace which heats the home in cold weather. A cast-iron coal chute in the east wall permits the coal to be thrown into the basement without injuring or discoloring the wall.

One of the most notable features of the exterior of the house is the spacious front porch which is largely built of hollow-tile, thus demonstrating the flexibility of that material. This porch has cement steps and a cement floor, and is screened in for summer living. A large electric light has been placed in the ceiling which is built of siding dressed and matched, beaded center and side. When finished, this ceiling was varnished.

The roof is constructed of 2 x 4 in. tie beams spaced 16 in. apart on centers, and 2 x 6 rafters, spaced 24 in. on centers, over which was placed car siding to form a sheeting. Green composition shingles were then laid over this sheeting. The

The Rear of This Bungalow Is Neat and Has No Unnecessary Fixtures roof is drained with galvanized iron gutters, while flashing, valleys and ridges of the same material have been laid so as to make a thoroly water-proof roof. A red brick chimney topped with a stone cap finishes off this part of the building.

The South Exposure Taken Before the Building Was Finished

Had this house been built of frame, the fact that it cost only $2,755 would have little interest, simply because there are thousands and thousands of small homes being built of that material thruout this country for the figure named and even less. But the walls of this house are of masonry—hollow clay building tile—and this is what makes the home here shown worthy of more than a passing interest.

It is unfortunate that the merits of hollow-tile are so little known among builders. While the fact that this material makes a building that is perfectly dry at all times, warm in winter and cool in summer, one that requires little or no repairs, should be of vital interest to the contractor because it makes satisfied clients, there are advantages that appeal more directly to his pocket-book than perhaps those above mentioned.

The itemized bid of the successful contractor follows, and altho there might have been a few extras, the owner states that the work was done for approximately the total shown:

Masonry	$ 555.00
Carpentry	900.00
Excavating	25.00
Plastering, inside	150.00
Plastering, outside (stucco)	120.00
Painting	125.00
Sheet Metal	40.00
Plumbing	275.00
Heating	150.00
Mosaic Tile	25.00
Fixtures and Hardware	150.00
Electric Wiring	40.00
Miscellaneous	200.00
Total	$2,755.00

Another interesting fact about this house is that in building it, the contractor who did the work "tackled" his first job of hollow-tile and, as may be seen, turned out a very creditable piece of work. The next time he undertakes a job in which this material is used, there is no doubt but that he will finish with a larger profit and with a better piece of work, made possible by the experience gained from his first job. And so it may be seen that long experience and specially trained masons are not required for the successful performance of work involving the use of hollow-tile, altho in this, like in all other lines of endeavor, experience, skill and specialization make for still larger profits.

The Large Front Porch is Easily the Dominating Feature

New Company Takes Over Denison Tile Patents

A merger of important factors in the clayworking industry into a $500,000 corporation, was announced at Cleveland, Ohio, during the last week of April. The new organization will be known as the Denison Interlocking Tile Corporation and is incorporated under the laws of West Virginia with a capital amounting to the above mentioned sum. The general control of Denison interlocking tile interests, including the ownership of the patents, passes into the hands of the new company, which has also purchased the capital stock of the Interstate Clay Products Company.

Bert J. Graham, president of the Interstate Company, has been appointed vice-president and general manager of the new corporation. He will also continue as president and general manager of the Interstate Clay Products Company, which has been handling the sales work for interlocking tile in Ohio, western Pennsylvania, western New York and West Virginia. The scope of this company's activities, however, will be broadened considerably to include Kentucky, Michigan and western Indiana and, later, such other territory as may seem advisable.

The offices of the Denison Interlocking Tile Corporation—the new company—are in the Hippodrome Building, Cleveland, from which an extensive campaign of advertising and selling will emanate. This campaign will be conducted in the United States, Europe and South America. At this time there are twenty-six factories in this country and Canada, operating as licensees under the Denison patents with sixty sales offices in the same territory.

Associated with Mr. Graham in the management of the new concern are men prominent in the industry located in all parts of the country. Robert Gamble of Gamble and Stockton, Jacksonville, Fla., is president; Burton J. Mitchell, secretary and treasurer, who is also president of the Mitchell Builders' Supply Company, Niagara Falls, N. Y. In addition to the above, the following are directors: J. A. Maahs, secretary and treasurer of the Pennsylvania Fireproofing Company, Erie, Pa.; H. S. Renkert, treasurer and general manager of the Metropolitan Paving Brick Company, Canton, Ohio; Telfair Stockton, president of Gamble and Stockton, Jacksonville, Fla., and H. H. Titsworth, president of the Clay Products Company, Indianapolis, Ind. W. C. Denison, formerly head of The Denison Tile Engineering Company, also holds an interest in the new company.

The SUPERINTENDENT

Helpful Hints for Practical Men Whose Problem is Maximum Production With Minimum Cost

Long Drier Tracks on Silica Brick Plant

A feature to be found on plants manufacturing silica brick, which have as their chief characteristic the production of the largest possible amount of salable ware, that deserves special mention, is the construction of long tracks at both the receiving and discharging end of the drier. Coming direct from the hands of the molders, the brick are in a very moist condition as they are placed on the drier cars—necessarily so because a large amount of water must be added to the raw material to make it plastic enough to be molded. It is a matter of common knowledge that, at this stage of the manufacture, the bond of the brick is not very strong, the least jar producing a rupture.

The particular point in the manufacturing process at which most shocks are encountered is at the transfer track and, unless the brick have a fairly strong bond when they arrive at that point, there is danger of considerable harm being done thru jars received. Long drying tracks are undoubtedly the most effective solution to this problem as they eliminate these shocks until the brick are sufficiently strong to withstand them without being weakened. When long drying tracks are used, the brick are given a chance to set and acquire strength before they are placed on the transfer track and are, consequently, in much better condition to receive the rough handling than if they were wet or exceedingly "green."

Not only at the receiving end of the drier do long tracks increase the efficiency of the plant, but also on the discharge end. Here a double consideration favors their use. Besides being the means of minimizing losses, they also increase the satisfaction of at least one set of employes—the setters. Where a short drying track is used the brick are often at a high temperature when the setters are compelled to handle them, which condition greatly retards their work and consequently decreases their efficiency.

This fact is also true on common or face-brick plants, whereas, with a long drying track at the discharging end of the drier, the brick are given ample time to cool before the setters receive them, making it possible for more rapid work at that end of the process and doing away with disgruntled employes.

Using Old Belting in Setting Tile

At best, the manufacture of drain-tile and especially of hollow building tile is a delicate operation, due to the character of the product. Unless a great deal of attention is given to every division of the process, cracked and unsalable ware will result. So much difficulty is encountered in the drying stage that, in many cases when the obstacles presented at that point have been successfully surmounted, the remainder of the process becomes mechanical.

However, there is one operation that follows the drying both in chronological order and in importance, and that is the setting of the kiln, in which much care must be taken or unnecessary waste is sure to result. There is one point in particular with regard to the setting of hollow-ware which should be watched very closely by the superintendent. After leaving the drier, the ware is supposed to be in a bone-dry condition and, because of this fact, it is often subjected to pressures that are far too great to be safely borne, placed there, perhaps, by the unthinking or careless setter. The most common of these pressures is his own weight, as he stand on the ware.

Some protection or support is needed to distribute this weight evenly over a number of tile and not have it centered on the immediate few under the setter's feet, which in many cases, if not properly protected, are badly damaged. An ordinary board is too cumbersome to use inside of a kiln, especially in the tight places in which the setter often finds himself.

A better device to use for this purpose is a strip of old belting laid on top of a course upon which the setter may stand and which affords an excellent protection for the tile beneath. Belting is usually sufficiently strong to bear the weight of the man and distribute it over many tile, besides being extremely flexible. This last mentioned quality is of particular advantage as the support can be rolled up and easily put out of the way when not needed or when the "squeeze is too tight."

Some Rope vs. Belt Figures

Rope drives cost less than belt drives on large units, but first cost should not be the deciding factor, says S. F. Wilson in "Power."

I have before me an argument favoring rope transmission for a 1,000-hp. drive because the combined cost of rope and pulleys is $900 less than for the belt and pulleys. Allowing both drives a high efficiency— belt 95 per cent., rope 90 per cent. (there is at least 5 per cent. difference)—for the rope drive the brake horsepower of the engine must be 1,000÷0.90 =1,110; for the belt drive the brake horsepower must be 1,000÷0.95=1,050, or 60 hp. more would be necessary with the rope drive.

At 1c per hp.-hr. for 3,000 hr. per yr., the cost would be $30, and 60 hp. would cost 30×60=$1,800 per year; thus at the end of one year the $900 saved in first cost would be doubly lost and each succeeding year $1,800 would be lost.

This of course is nothing new, but is meant to point out that sometimes saving in first cost is not economy.

Eliminating Losses from Vibration of Drier Floors

A valuable suggestion comes from a drain-tile plant in Illinois which employs the same type of drier for drying the large sizes of tile as is often found on a sewer-pipe plant. This drier is known as the sewer-pipe floor-drier and incidentally, this suggestion may be of value to manufacturers of sewer-pipe as well as to the maker of large size drain-tile using this type of drier.

Usually where this piece of equipment is employed, the drying floors and the machine room are in the same building. In many cases the vibration which results from the operation of the machines is very strong, same being transmitted to the drier, causing a weakening of the ware that is being dried on the floors in close proximity. On the plant

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above mentioned, after suffering considerable loss from this cause extending over a long period, it was decided to separate the two buildings, making them entirely independent of each other. This was done, a large double door being left leading from the machine room section to the drier on every floor. Needless to say, after this change was made, the vibration in the floor-drier immediately ceased, as did also the loss of ware which had been traceable to this source.

Especially valuable is this suggestion to the clay plant owner who is contemplating the building of a new floor-drier. Reconstructing the old to conform with the one suggested is, in many cases, impossible and if the vibration is not too strong, it would be unnecessary. However, it is a point that might well be heeded in the construction of a new drier of this type.

Why a Chimney Smokes

A fundamental principle to apply when remedying any evil, says "Factory," is first to understand the causes which underlie the trouble. In a pamphlet on smoke abatement, Professor C. H. Benjamin, Dean of the Schools of Engineering, Purdue University, explains why the furnace smokes. His explanation will aid materially in locating the seat of the trouble and indicates the line of attack to remedy the smoke evil.

"The cause of objectionable smoke when soft coals or fuel oils are burned is the presence of hydrocarbons in the fuel. Anthracite coal contains no hydrogen and is practicallly smokeless. Coke, which is prepared by distilling the hydrocarbons from ordinary soft coal, is nearly pure carbon and gives off but little smoke. The semi-bituminous coals of Maryland and West Virginia are intermediate between the anthracite and soft coals and burn with less smoke than the latter.

"The way in which black smoke is formed may be easily seen in an ordinary grate fire where soft coal is used. When fresh coal is put on such a fire, the heat gradually distills the volatile gases which contain the hydrogen and we see a whitish or yellowish smoke issuing from the crevices in the coal. This smoke is not objectionable and will not discolor materials with which it comes in contact. As the heat increases this gas ignites, burning with a yellowish flame which shows the presence of carbon.

"As long as a good air supply is maintained and the temperature is sufficient, the combustion continues without smoke. If, however, the flame strikes the back of the grate and becomes chilled or if insufficient air is present, the combustion is retarded and fine particles of unburned coal or soot are precipitated. Some of these particles will pass up the chimney with the gas; others will be deposited on the brickwork. Further increase in the temperature of the fire and the walls of the grate will result again in more or less complete combustion without smoke.

"The flame of the ordinary coal oil lamp is another good illustration of smoke and its prevention. In this case the oil is the fuel, the wick represents a mechanical means of supplying fuel to the flame, the chimney creates the draft and the perforated metal at the base of the chimney serves to preheat the air.

"If the wick is properly adjusted, the fuel burns with a clear yellow flame without smoke. If the wick is turned too high there is an excess of fuel or, in other words, a deficiency of air and the flame becomes smoky. With the wick in its normal position, a raising of the chimney at the bottom allows too much cold air to enter and chills the flame, again producing smoke. The introduction of a cold metal or earthen rod into the space above the flame will chill the latter and soot will be deposited on the rod.

"It is evident from these two experiments that the requisites for good combustion are a sufficient but not excessive supply of air, a high temperature and, we may add, a thoro mixing of the air with the burning gases.

"In ordinary hand-fired furnaces where soft coal is used, smoky conditions always exist after firing. The introduction of a large quantity of unburned fuel would necessitate an additional supply of air and a high temperature for good combustion. On the contrary, the grate being more or less clogged by the new fuel, less air is available than usual. Just sufficient heat is available to drive off the gases and produce a smoky flame which leaves soot on everything it touches. What is needed at such times is a sudden increase of draft with a suitable air supply.

"The conditions which are most favorable for smokeless combustion are a uniform supply of fuel coupled with a uniform supply of air introduced in such a way as to mix thoroly with the burning gases. In this way the conditions are kept constant and the combustion is steady and regular. Such a result is best attained by the use of mechanical stokers and forced draft."

Record Breaking Paving Contract in Far West

Two records were smashed recently by the commissioners of Kings county, Washington, when they let a contract calling for the paving of a new highway between the city limits of Seattle and the city of Des Moines—a distance of approximately ten miles—with brick. The cost of the pavement will reach $222,691.22, the largest sum involved in any single road contract in the history of the county which is noted for its already extensive and rapidly growing system of brick-paved highways.

The other record to be dethroned by the board's action was the quantity of paving-brick to be used in any single contract west of the Mississippi River. The order given has no parallel in the territory named, over 7,000,000 "pavers" being required to complete the road, all of which will be furnished by the Denny-Renton Clay and Coal Company of Seattle. This company has done much to make permanent roads a reality in the land that is noted for its vast timber resources.

Possibly a third broken record might be mentioned in connection with those above enumerated. This is the largest single order that Denny-Renton Company has received in the many years in which it has been doing business in the Pacific Northwest. This order is sufficiently large to bring about a resumption of capacity operations at that company's large plant.

The new highway is to be twenty-one feet wide and of the monolithic type of construction, the brick being set on a concrete base in a "green" mortar bed much the same as those at Paris, Ill., and at other points. When this road is finished King county will have more than thirty miles of brick-paved highways.

It is interesting to note the stand taken by the county officials with regard to the agitation that was making itself felt in favor of a concrete road. The attitude of the commissioners toward this cheaper and poorer type of paving was well presented by the chairman, who said that the superiority of brick over concrete as a paving material was so great that the board would be guilty of extravagance and wasteful management, if it should specify a concrete road, the cost of upkeep being so much greater on this type than on brick.

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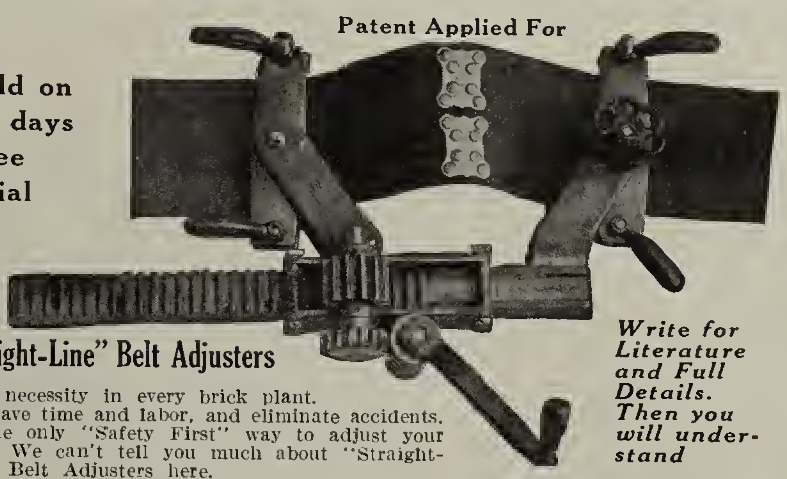

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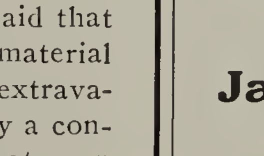

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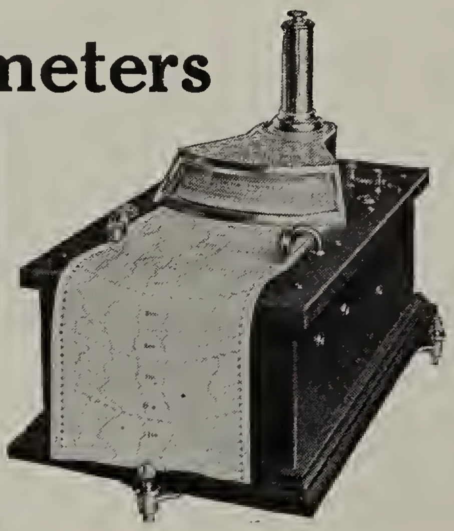

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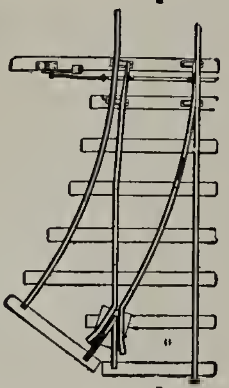

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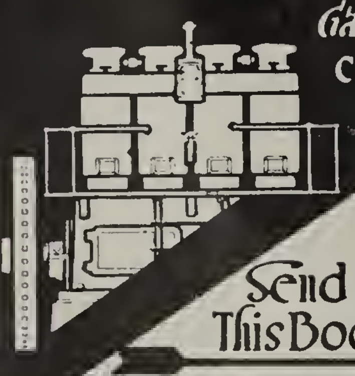

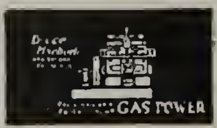

QUESTIONS

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Address all communications intended for this department to "Editor, Questions and Answers," care of "Brick and Clay Record," Chicago.

Soft Mud Brick Give Trouble in the Drier.

768. *Pennsylvania—We have an interest in a large deposit of clay located near the Delaware river. It is low land and rather swampy, and a portion of our clay seems to be very plastic. There is very little soil—not more than four or six inches—on top of a yellowish clay, which is about one foot deep. We then strike a very plastic blue-colored clay which runs to a depth of about two feet, under which is a black mixture of clay and sand which extends down another foot. Under this is a white sand.*

We have been using the three mixtures together, not including any of the white sand, in the manufacture of a soft-mud brick which is dried on a horizontal pipe drier. Our brick seem to come from the machine in perfect condition but, after being in the drier a short time, they crack. They do not seem to throw off moisture, but a hard crust forms on them while steam is generated on the inside which must break out.

We have tried leaving the brick stand for several hours before turning on any steam and then turn on a very little at a time. We have also tried mixing sand with our clay but this does not seem to have the desired effect.

We run our clay thru a crusher and then into the machine, which you understand has a pugmill attached. We operate this pugmill and machine with extra knives, these being sixteen in number, and the clay seems to be thoroly pugged. We would like to receive any suggestions you may have to make as to how we can overcome our difficulty.

We believe that your problem can be summed up in two words—drier trouble. Some of the clays along the Delaware river are extremely hard to dry under any circumstances and would give more trouble when made up into soft-mud brick, on account of the high moisture content of brick made by this process, than in any other form.

The very fact that a hard crust forms on the outside of the brick, particularly after they are put into the drier, shows that they are drying on the outside first instead of vice versa. In order to dry any tender clay, it is absolutely necessary that the water be taken from the inside of the ware first and that the outer skin does not dry until the very last. In fact, this is scientific drying and any dryer that does not accomplish this but which dries on the outside first, is wrong in principle as well as in practice.

It is impossible for us to say whether or not you can dry your brick properly in the drier which you now have, but if you can so regulate it that the ware will remain in a moist steamy atmosphere until it becomes heated thru, you will be progressing a long way toward over-

and ANSWERS

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Should a reply be desired by letter, send a stamped and addressed envelope with your question, and it will be answered promptly.

---

coming your difficulty. The idea of the moist steamy atmosphere around the brick during the early period of the drying is to keep the outer skin from beginning to dry until the heat permeates the brick and starts evaporation from the interior. If your drier cannot be regulated to do this, nothing can be done except to change it and in such a case, the best plan would be to call in an expert on drying. Very difficult clays are being handled successfully in various types of driers and there is no question at all but that one can be designed or your old drier redesigned, so as to get away from your trouble.

While it is rather difficult to prescribe any further remedy without knowing more particulars, we will make two suggestions which come from Prof. Homer F. Staley, Iowa State College, at Ames, as follows:

"Add from one-half to one per cent. of common salt to the clay as it goes to the crusher. This slows down the drying on the surface and produces a better capillary system which tends to cause the clay to dry thoroly thruout rather than just at the surface shell.

"Second, protect the brick from all circulation by canvas covers or otherwise, until they have reached the maximum temperature of the drier, then allow circulation to increase gradually. In nearly all cases, if clay wares can be heated up without cracking, they will not crack afterwards and the safest way to heat up brick in the ordinary drier without cracking, is to protect them from all circulation."

Lime Content in Magnesite Brick

775. *Pennsylvania—We would like to know if brick can be made from magnesite with twenty-eight per cent. of lime. If this cannot be done, what is the highest lime content in the magnesite that can be used? Also will you kindly advise us if good silica brick bats, fresh from the kilns, can be used in the bottoms of acid furnaces in place of crushed ganister rock. Where can a market be found for this material?*

Brick cannot be made out of magnesite with twenty-eight per cent. carbonate of lime. About eight per cent. of calcium carbonate seems to be the highest lime content that is used in magnesite brick of good quality. Of late, however, attempts are being made to manufacture brick from a very hard dolomite, containing as much as fifty per cent. of carbonate of lime, by adding silica and iron oxide and burning the material to a very high temperature both in the preliminary sintering and in the burning of the brick proper. While such a material would be satisfactory to put into the furnaces at once, previous experience seems to indicate that such brick cannot be stored for any length of time without breaking down.

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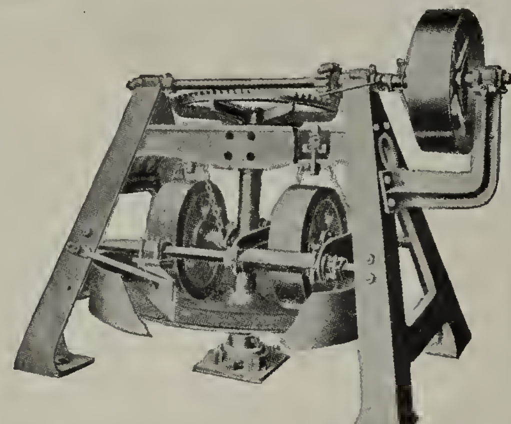

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Regarding your inquiry as to whether or not good silica brick bats, fresh from the kilns, can be used in the bottoms of acid furnaces in place of crushed ganister rock, we see no reason why this cannot be done. We would suggest that you write a number of large steel corporations regarding this subject, stating that you have such material to offer.

A Practical Test for Impurities in Clays

758. Illinois—In your book "Clayworking Problems," there is a question asked by No. 680, Quebec, in which, according to my opinion, you do not clearly explain about the analysis of lime. We are very much troubled with both sulphur and lime and I would like to be in a position to make my own analyses of our shale so that I can tell how much iron, lime, sulphur, magnesia, silica and alumina is contained in the shale and whether this proportion changes as we get further back into our bank. I would like to be able to do this without going into a great amount of expense for chemicals and utensils.

I have been reading Jackson's "Text Book on Ceramic Calculations" and note that on page 3 (examples 3 and 4) the answer is given, but the author does not describe the manner in which this solution is arrived at.

The same may be said in connection with the Bischof formula published on page 176 of Ries' "Clays: Their Occurrence, Properties and Uses."

A practical qualitative test for impurities in clays which was given to those who attended the short course in ceramics at the University of Illinois during the early part of the year, follows:

In order to test for sulphates soluable in water, boil one ounce of the clay in a quart of distilled water; allow the clay to settle and then pour off the water. Add to this water a few drops of barium chloride ($BaCl_2$), using about one-half pint of the water and stirring well with a clean glass rod. A very fine grained white precipitate will result. To this add enough hydrochloric acid to make the solution distinctly acid as shown by the fact that it will turn blue litmus paper red. If any of the white precipitate remains after the addition of hydrochloric acid, the sample of clay tested contains sulphur which is soluble in water.

In order to test for the presence of iron salts which are soluble in acid, boil a small portion of the clay in a pint of HCl (hydrochloric acid) solution, using about one part of HCl to four parts of water. Allow the clay to settle and then pour off some of the clear solution. To this add a few drops of potassium ferro-cyanide. If iron is present, a very deep blue solution will result.

To determine the presence of carbonates in the clay, take a small amount of it and cover with water. Stir them both together well in order to expel all of the air bubbles, then add HCl. If carbonates are present, gases are given off, producing a foam on the top of the liquid. This is always the result when HCl is added to carbonates. Apply a little heat if the gas action is slow, as this accelerates the chemical changes that take place.

A practical test for the presence of lime in the clay is to pour HCl on a sample of the clay. The presence of lime will be shown by efflorescence or bubbling. A more detailed and accurate test may be had, however, by boiling a sample of the clay in a diluted solution of HCl, the liquid then being filtered thru a filter paper. Add to the clear solution thus obtained some ammonium hydroxide. A reddish precipitate will be formed. Filter off again and add to the clear hot liquid some ammonium oxalate. If lime is present a white precipitate will result.

The presence of ferric oxide is determined by boiling a sample of the clay in dilute hydrochloric acid (HCl) for some time and then filtering thru a paper. To the clear liquid thus obtained, add some ammonium sulpho-cyanide. The presence of oxide of iron will be indicated by a brilliant red-colored solution. To further determine the presence of iron, proceed as before, but instead of ammonium sulpho-cyanide, use potassium ferro-cyanide. A strong blue color indicates iron.

In order to test for magnesia, allow the lime precipitate obtained in a previous test, to stand for several hours. To be sure that all of the lime is precipitated, filter off the lime precipitate and to the clear solution, add a few drops of $NaNH_4HPO_4$ (sodium ammonium hydrogen phosphate), stirring vigorously. Allow this solution to stand as the resultant precipitate forms slowly. After formation of the precipitate, add ammonium hydroxide in excess. A white precipitate results that is magnesium ammonium hydrogen phosphate. This test should always be made with a cold solution.

In looking for impurities in clays, a rough, or sieve analysis, may be made. To make a sieve analysis, proceed as follows:

Soak the clay in water, two parts by weight of clay to two parts of water. Sieve this material thru a coarse mesh, then an eight mesh, then twelve and sixteen, running it down thru a forty mesh. If a finer mesh is available, use it. Then, by drying the material left on each of the sieves, the amount of residue can be weighed and determined. In transferring the tailings from the sieves to the beakers or tumbles, clean water must be used. The different specimens left on the meshes, having been transferred to a tumbler, can then be tested for impurities. If lime is present above the forty mesh screen, there is danger of its slacking when exposed to the weather and disintegrating the brick due to the comparatively large size of the particles.

Three substances that occur in comparatively large sizes in clays are gypsum (calcium sulphate), iron pyrites (iron sulphide) and limestone (calcium carbonate). All of these are often the source of considerable trouble in molding the ware, gypsum particularly, due to the fact that it causes "whitewash" by dissolving in water and then reappearing on the surface of the ware in the drier when the water is evaporated.

Iron pyrites gives much trouble because of the sulphur that it gives off, which, when released into the atmosphere of the kiln, either from the fuel or the clay, has a tendency to combine with the water or moisture which is to be found especially on the bottom of the kiln during the early part of the burn. This combination forms sulphuric acid (H_2SO_4) which not only causes whitewash, but is responsible for the poor, spongy structure of a great many brick.

The presence of calcium carbonate in a clay causes a large number of harmful effects, due to its power and treachery as a flux. It often limits the vitrification and fusion points to such an extent that only those products that are not vitrified or burned to a very high temperature, can be made from clays containing a high percentage of this substance.

Bulletin No. 422 of the United States Geological Survey, entitled "Limestone and Silica Rock Analysis," gives three or four different methods of determining impurities in clays, and may be had by addressing the Superintendent of Documents, Washington, D. C., and enclosing a money or postal order for twenty-five cents.

Keep the Heat in Your Drier

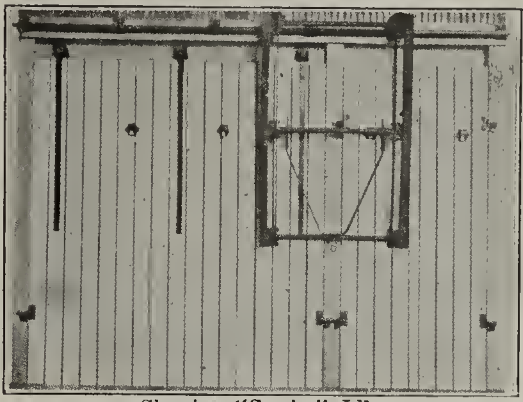
Why waste fuel just because your drier doors don't fit tight? They can be made tight in the first place, and kept tight, if you equip your drier with the

Perfected Dry Kiln Door Carrier

Will handle doors from 2' to 8' wide and 5' to 8' high. Made for wood or fireproof construction. Write for catalog B2 and all details.

Sold on 60-day trial.

Dry Kiln Door Carrier Co.
Indianapolis, Ind.



Showing "Carrier" Idle.

PYROMETERS

One customer using Brown Pyrometers writes, "Had we had your Pyrometers when we started in business 20 years ago we would be rich today." Why don't you start right at once?

The Brown Instrument Co.
Philadelphia, Pa.
New York Pittsburgh Chicago

Do You Need Dryer Cars?

Cars that are built heavy and strong—cars that will not warp—cars that will resist for years an alternation of low, wet heats and high, dry heats—cars that will stand rough handling—that only need oil to keep them moving, and bearing full loads, season after season. We have such cars and on these cars we guarantee satisfactory service, and on our Special Cars, Turntables, Grate Bars and Grey Iron Castings.

Pettigrew Foundry Co.
Harvey, Illinois

PERFORATED METAL SCREENS

As required for
BRICK
MAKERS
USES.

PERFORATED SHEET METALS OF EVERY DESCRIPTION
HENDRICK MANUFACTURING CO.
CARBONDALE, PENNA.

Manufactured by
HENDRICK MFG. CO.
CARBONDALE, PA.

New York Office
Room 524 Cortlandt Building

We Do Not—and We Will Not Sell
Inferior
Pyrometer Equipment

Base metal equipment can not stand up under clay plant temperatures. It is folly to expect it.

It costs less the first few months but the repair bills soon equal and exceed an original cost of quality equipment.

In addition you can not depend on the readings.

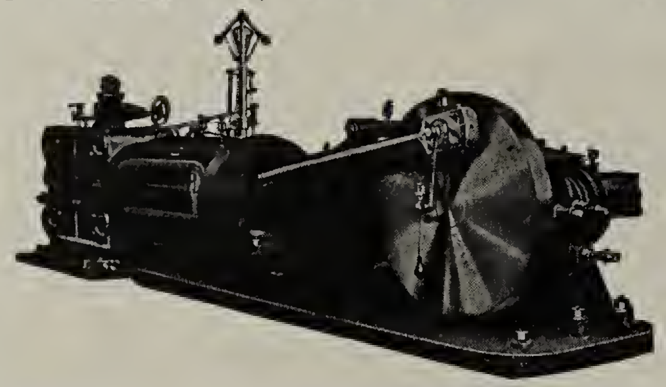
We guarantee satisfaction.

The Stupakoff Laboratories
PITTSBURGH, PA.

POWER PLANTS COMPLETE
CORLISS ENGINES, WATER-TUBE AND TUBULAR BOILERS

Send for Catalogue No. 65-B

Murray Iron Works Co. Incorporated Feb. 1, 1870 BURLINGTON, IOWA



"Rust Special" Clay Feeder

It Eliminates Two Men
A Saving of Twenty-Four Dollars Per Week
It Performs Their Work—Perfectly
Ask for the "Rust" Bulletin
MARION MACHINE, FOUNDRY & SUPPLY CO.
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"Buckeye Rails Are the Standard for Quality"
THE BUCKEYE ROLLING MILL COMPANY
Exclusively Manufacturers of First Quality Light Steel Rails and Accessories
Offices: Steubenville, Ohio
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BUCKEYE MEANS BEST
BEST MEANS BUCKEYE
All Sections from 12 lb. to 40 lb. per yard
Write or wire us, when in need.
No order too large to handle promptly or too small to secure immediate attention.

The SALES-

Short Stories That May Help the Salesman Who Aspires to Salesmanagership and the Salesmanager Who Wishes to Retain His Ability to Close Big Deals

Learning Lessons from Lost Orders

A prominent manufacturer of a line of machinery has a file that is constantly productive of valuable information. It is known in the office of that concern as the "lost order" file and every time an order is lost, a report is made by the salesman showing just why it got away from him. It is not always possible to get at the facts, but usually the reason for not securing the business can be ascertained.

Now, here is the lesson: By giving close study to the reasons offered by customers for giving their business to a competitive house, this manufacturer has been able to improve his product and methods of merchandising, with the result that the amount of business now being done by this company is showing a marked increase from year to year.

This story might just as well as have been told with the clay products manufacturer as the principal figure and with his salesmen making reports to be laid away in the "lost order" file. It is just as important for him to know why the "other fellow" got the business in any particular case, as it is for this machinery manufacturer to have this information.

Also it is equally important to know why you didn't get a certain order, as why you secured another order. Did your competitor offer a product that appealed to the purchaser because of its appearance or color? Was his price lower? Were you out of line because of higher freight rates, or what?

These are just a few of the questions that will suggest themselves when you fail to "land" the business you have been seeking. Your answers to them will probably show you a way to get a larger share of the trade. And if you cannot give the answers to these questions, it is up to you to find them, even tho this involves extended research and study, because until you do know why you are not getting certain business, you are not in a position to compete intelligently.

Educational Work Counts

One reason, perhaps, why clay products manufacturers do so little educational work—that is, work which is designed to inform the public of the merits of burned clay building materials, rather than to get specific orders—is the difficulty of tracing direct returns to that sort of effort. Yet there is no getting away from the fact that when work of this kind is done continuously, it has a marked effect on the number of sales secured in the course of a year or so.

A certain brick dealer has a large bulletin board in front of his place of business, which stands on a prominent thorofare, on which he displays regularly some announcement regarding his brick. Sometimes this bulletin board tells of the material which he is furnishing on an

MANAGER

If These Stories Help You, Let Some of the "Bigness" That Has Made You a Successful Salesman Cause You to Write Us One Selling Letter

important job. Again, it may list all of the leading lines which he handles, or it may extend an invitation to come in and look at the panels which he has on display. Incidentally, these panels can be seen from the street, and the curiosity aroused by a partial view is sometimes satisfied when the invitation on the bulletin board is accepted and the customer comes in.

"We don't know definitely that we are selling brick with the aid of this bulletin board," said the salesmanager of the company, "but we do know that, thru all of our educational and publicity efforts, we are gradually increasing our volume of business, and, for this reason, I think we are justified in continuing the work which we have started along these lines."

One Price Only

Nearly everyone has some recollection of an experience with a clothing merchant of the David Warfield type, who makes a point of selling all who enter his store. If the customer will not buy a suit at twenty-five dollars, it is offered at twenty dollars. If this does not "bring him across" another concession is granted, and so on, until the sale is finally made. Thus, the only way in which a patron is able to get a rock bottom price is to haggle and bargain until the merchant will go no further.

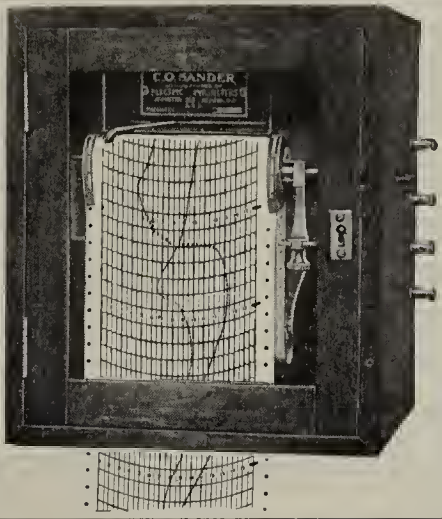
This suggests a few of the many disadvantages of not adhering to the one-price standard, whether it be in the clothing business or in the marketing of some clay product. Now and then, there is a temptation to get business by giving someone an "inside price," but sooner or later this will leak out, with the result that dissatisfaction and distrust arises against the concern that has made the lower price. Customers will never be sure that they have been given the best price that could be made, but will always have a suspicion that someone else has secured a more favorable quotation.

The salesman who insists that he is quoting his best price in the beginning and sticks to it, loses nothing in the long run. Altho he may not make a sale by failing to meet a certain price, still he will have made a very lasting impression upon the purchaser—that his is a one-price house.

Study Important Trade Literature

A certain brick salesman in an important market has won the reputation of being an expert on mortars which has been of considerable advantage because of the tendency of architects to take up with him their problems involving the question of the correct mortar colors and the best methods of laying up brickwork.

This salesman has acquired his knowledge thru the very simple plan of study and observation. His opportunities in this respect have not been greater than those of some



Guessing Is Poor Business

You don't guess at the time of day. You look at your watch and KNOW. Why guess at temperatures? It is infinitely harder to do it correctly, almost impossible. The money lost as the result of one guess would pay for a Sander. Ask

The Sander Instrument Co.
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Some of the very best plants are
DRILLING
BIG BLAST HOLES
WITH A
CYCLONE DRILL

In some cases the drill has saved its original price in three months' use.
Send for Bulletin B 4.

THE SANDERSON CYCLONE DRILL CO.
ORRVILLE, OHIO

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101 Questions Answered

A Book for the Clay-worker

New—just off the press—bound in cloth and illustrated. It contains more than a hundred problems presented in real plants and *solved* by the foremost clay-working experts of the U. S. and Canada.

184 pages of live information that can be coined into dollars on every clayworking plant.
Price $1.50

Sent post-paid on receipt of check, cash or money-order by

Brick and Clay Record
445 Plymouth Court CHICAGO

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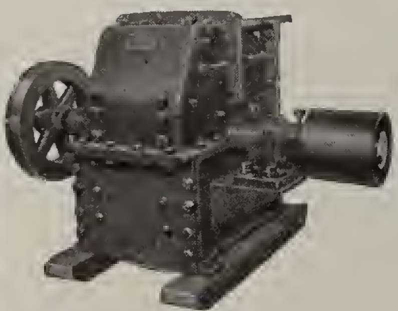
The Same Work with Less Power
The ALL-STEEL No. 1

K-B PULVERIZER

Consumes only 10-15 h.p. to reduce 4-7 tons of stone, or 8-13 tons of clay per hour from 3″ to dust. Larger machines have the same high efficiency.

It is built entirely of steel and lined throughout with manganese hardened steel plates. It will endure the hardest service.

The hammers are adjustable to compensate for wear and to keep the product uniform.



Easy access is afforded to the inside of the pulverizer, as the screens slide out of the lower casing like drawers.

Write today for full details to the

K-B PULVERIZER CO.,
Inc.
86 Worth Street
New York City

LEHIGH PORTLAND CEMENT CO.
LEHIGH
ALLENTOWN, PA.—CHICAGO, ILL.

Don't Take the Risk

If you make a good brick, why endanger its reputation by permitting the use of an inferior cement? Good brick should be set in good mortar and GOOD mortar is made of *good* cement.

A paving block doesn't get a fair chance if imbedded in poor concrete or set in an uncertain cement.

Lehigh Cement Is Dependable

Its mixture is uniform—high in strength—the same in color and fineness, and helps make permanent buildings and ever-lasting pavements.

LEHIGH
CEMENT

Cement Grout for Permanence

others in the same business in that town, but there is no doubt that he has given more time to the study of the proposition.

Mortar color manufacturers issue literature on the subject of the proper combinations of brick and mortar color to use in order to secure the best effect, and this particular salesman has made a point of going over this literature again and again, studying it often enough to master the principles. Furthermore, instead of merely using the books which have reached him for reference, he knows the basic ideas which they contain and, therefore, understands the mortar question thoroly.

Whenever the brick salesman has an opportunity to add to his store of knowledge on any subject pertaining to his business, it is a good plan to take advantage of it. He may not know just how he is going to use the information which he acquires, but it can usually be depended upon to make its lack or possession felt in time of need.

Smoothing Over a Lien Notice

A certain state passed a lien law some time ago in which it was provided that, unless the manufacturer or dealer supplying materials on a job gave notice to the owner of the building within thirty days after the delivery of the goods, his right to exercise a lien was forfeited. This was an unusually severe law because the period was too short to enable the bill for the material to be collected in the ordinary course of events which meant that either the dealer would have to file notice without knowing whether it was necessary or not, or take a chance of getting "stung." As a matter of safety, most brick manufacturers and dealers, as well as those selling other building materials, decided to give notice in all cases in order to protect themselves from any contingency which might arise.

One brick dealer, however, saw the possible effect of such a course upon contractors and took steps to meet the situation. He sent a letter to every contractor in his city explaining the situation and advising what the policy of his concern would be in the future with regard to lien notices. He pointed out that no reflection on the credit of the contractor was intended and that this should be thoroly understood. In filing notice with the owner he usually explained that this was to comply with the law, and not because the bill against the contractor was due or payable.

This action made a very good impression on the contractors and, while protecting the interests of the concern in question, it prevented the arising of any small misunderstandings which often lead to greater differences and even to real enmity, which, it is needless to say, is fatal to the securing of future orders.

The Personal Equation

Personal considerations are sure to determine the fate of a lot of business at one time or another. This is something that will always be true for merchandizing and trading will never be so systematized, so "cut and dried," that this element will be eliminated. Other things being equal, the buyer is going to favor the bidder who is most agreeable to him personally. No one can find much real fault with this tendency.

This brings out the lesson that a salesman should make as many friends as possible. As long as the personal equation "cuts a figure" in securing orders, and inasmuch as you can nearly always count on those who come into the market favoring their friends whenever they can legitimately do so, it would certainly seem that there is a sound basis for this advice. Friends are worth while just for the sake of their friendship, entirely apart from selfish consideration, but from a business standpoint, the salesman who would be successful knows that he can use all of the friends that he can put on his staff for they will be in a position to give him a "boost" now and then just when he needs it most. In a great many cases, the difference between the various offers and inducements made and held out to the prospective customer by the clay products salesman do not differ sufficiently to "swing" the business one way or another, and it is then, that the personal factor counts. Usually, if there is a great difference in price, the low man gets the business, but when the difference is small, there is nearly always a chance for the buyer to do a good turn for the man whom he knows, and he is usually ready to do it.

The salesman who makes friends and who associates himself with business and other organizations where he has the opportunity to meet people, is going to find the personal factor working for him instead of against him, especially in critical situations.

The Semi-Monthly Trade Review

THE EXCEEDINGLY OPTIMISTIC predictions made concerning building conditions in the United States during the present year are already beginning to show signs of being fulfilled.

Despite the fact that labor is demanding a higher wage, especially in the building trades, and with transportation difficulties which are preventing the prompt delivery of materials, the demand for clay products that enter into the construction of buildings thruout the country is exceedingly good.

The opening up of the spring season, permitting extensive out-of-door work, was marked by a rush of builders to get their structures under way as soon as possible. Plan filings rank well when compared to the same period last year, indicating a busy season ahead for the manufacturer of burned clay building materials.

Reviewing trade conditions as they exist on the eve of this paper's going to press, beginning with New York, the mirror that reflects the situation in the East, we find a very favorable condition. While the price of brick at this point has dropped from $8 to $7.75 and $7.50 a thousand, yet indications are that this level will be maintained. These prices, however, apply only to Hudson River commons, Raritan

"A Pyrometer with a Conscience"

IT IS THE **Beighlee**

A Big Impressive Instrument

—made so sturdily that it resists rough handling.
—made so perfectly that it records perfectly year in, year out.
—equipped with a compensating device that compels your serious attention.
—equipped with the largest recording dial in existence (in itself a guarantee against errors, for a small dial CANNOT record accurately).

We say it has a conscience—we mean it. We go further—we say it is the best in the world—we can prove it.

Beighlee Electric Company, Cleveland, O.
Gibb Instrument Co., Highland Bldg., Pittsburgh, Pa.
Representative in Pennsylvania and Virginia
Herman A. Holz, Hudson Terminal Bldg., New York City
Representative in New England States

BALDWIN

You want a reliable, economical locomotive for service about your plant. Investigate the **Baldwin gasoline locomotive.**

These locomotives are reliable, because they are correctly designed and built. They are economical, because they consume no fuel while standing idle.

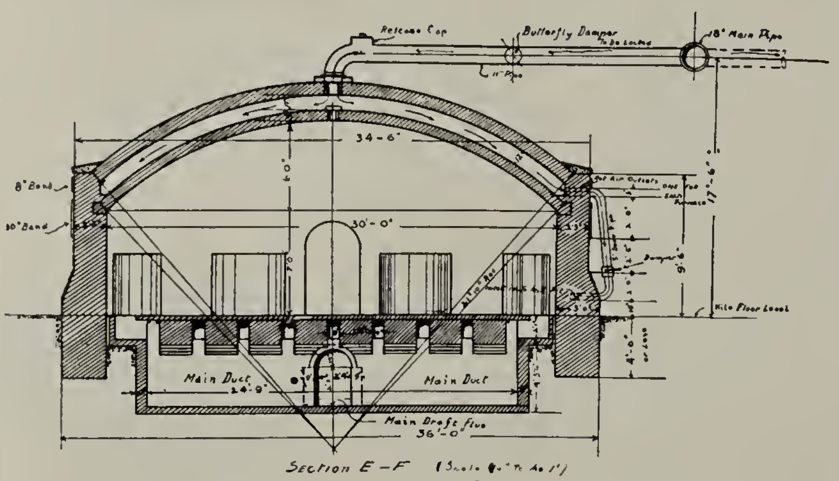
Record No. 74, which is yours for the asking, tells all about them.

THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA, PA., U. S. A.

Can You Burn Shale Paving Brick in 30' Kilns at a total cost of $.97 per M?

It can be done with our attachment on your kilns. A truly marvelous saving, due to application of common sense principles. Ask immediately for information.

McManigal Grateless Furnace Co.
Logan, Ohio



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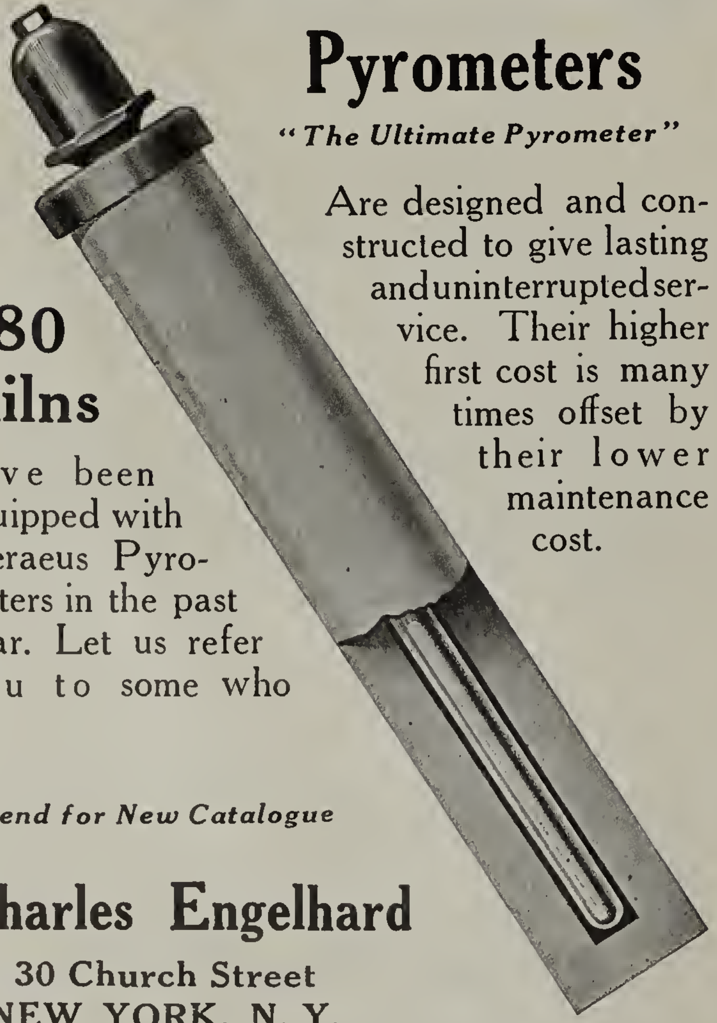
It can be built on your present kilns

Heraeus LeChatelier Pyrometers

"The Ultimate Pyrometer"



Are designed and constructed to give lasting and uninterrupted service. Their higher first cost is many times offset by their lower maintenance cost.

180 Kilns have been equipped with Heraeus Pyrometers in the past year. Let us refer you to some who

Send for New Catalogue

Charles Engelhard
30 Church Street
NEW YORK, N. Y.

reds commanding a price of $8.25 and, in some cases which involve immediate delivery, a higher price is quoted. A bargemen's strike which it was predicted would have a demoralizing effect upon the shipment of brick into New York; has scarcely produced any ill effects upon that product, chiefly because the main towing line handling the barges containing the majority of brick shipments, is not included in this labor dispute. Practically all the plants supplying the New York market have opened and are operating to capacity. The Hudson river yards, especially, are preparing for a record season's run. Early estimates covering building operations in New York City for the first half of the year indicate approximately the same value as last year with the number of operations slightly increased. It is expected, however, that the report of May building will greatly "boost" the average.

Passing on to Boston, it is found that this point is not enjoying as favorable building conditions as usually prevail at this season of the year. The weather is blamed for a falling off in new projects but it is believed that a few warm days is all that is needed to stimulate the demand in this section for building materials.

KEYSTONE STATE PLANTS REPORT GOOD BUSINESS

It is not so with Philadelphia. The "Quaker City" is experiencing a rapidly increasing demand for all products that enter into building construction. The amount of new building that is going on at this point is well in excess of the same period last year, that is, the four months ending April 30, permits taken out aggregating a value of $15,115,250 as against $12,323,700. Clay plants thruout Pennsylvania are reporting a good business, maximum production being the rule with very little danger of large stocks accumulating. Due to acute May Day labor troubles, a slight drop in the building barometer is read in Pittsburgh. While new building operations for April show a total of $1,250,762, this figure does not show up very favorably when compared to $1,767,600 for the same period last year. Bank clearings are exceptionally large, however, and money is plentiful, assuring a speedy recovery to former levels in building projects.

At Harrisburg, Pa., increased activity in building is noted, and additional increases are expected to develop as the season progresses. Much the same condition exists in Newark, N. J., which reports increased building in spite of a scarcity of labor and the exceptionally high prices prevailing for all building materials.

In the Southern Atlantic states a very encouraging situation is observed. Building in Baltimore, Md., is extremely good, increasing activity being noted in real estate, and both business and residential construction. An appreciable increase in the value of new operations over the corresponding period of last year is reported from Richmond, Va., which also states that favorable weather has had much to do with bringing about this excellent condition.

BUILDING RAPIDLY INCREASING IN CHATTANOOGA

Chattanooga, Tenn., is very enthusiastic over the successful building record made during April, which has been by far the best month during the present year. Local contractors predict a big increase during May in the volume of new projects over April and a continuation of very active conditions thruout the remainder of the year. The Westcott Brick Company and the Key-James Brick Company, both of which are serving this territory, report an unusual volume of business, the latter company having had to increase its sales force in order to keep pace with the increase in building.

Nashville, Tenn., a part of which suffered a serious conflagration during March, reports a very brisk demand for all building materials and more activity in this line than for several years past. Permits taken out are much larger than for the corresponding period last year.

The Chicago (Ill.) market shows April business to have been unusually good so far as the clay products manufacturer is concerned. Favorable weather and satisfactory prices have combined to raise the value and number of building operations during that month a notch or two, but indications point to a large increase in May building. Permits taken out for new business structures and additions in Chicago during April were seventy-six in number with a value of $2,337,600, compared with forty and $1,267,575 respectively in April, 1915. Building permits for the last week in April were $2,329,000 in value as compared with $2,183,500 last year.

LARGE STRUCTURES FEATURE CLEVELAND BUILDING

While the erection of small structures in Cleveland shows a gradual falling off during the past two weeks, large construction is still on the upward trend. This accounts for most of the local plants being over-sold. Large factories turning out munitions for the warring countries abroad are constantly adding new units to their plants, huge quantities of brick being required for this purpose. Twelve new schools are being planned for Cleveland and the surrounding territory, as well as many semi-public and public buildings. Common-brick is now being quoted at $8.50 a thousand as against $7.50 last year at this time. Car shortage is still acute, in many cases requests for six cars being filled by the shipment of one. Brickmakers operating in the vicinity of the "Sixth City" are taking any kind of cars they can get; where formerly only box cars were accepted, flat cars and even stock cars are now being used, the cost of cleaning the latter falling upon the brick manufacturers.

Canton and Toledo, Ohio, report building as being well above the average. A slump is seen in a comparison of figures to date for the present year and those of 1915 in Detroit, where the value of permits taken out in 1916 was $471,300 below the same period last year.

DENVER MAKES HUGE GAIN OVER LAST YEAR

Inclement weather is being held responsible for the slow development of building in the West. In all but Denver, Colo., abnormally cold weather and heavy rains have been the cause of a slow-down in the amount of building under way. However, with the advent of warm weather, which will permit extensive outside work, a greatly increased volume of building is anticipated. At the present time, Denver is rejoicing over the large gain made in building during the first quarter of this year over that of the same period in 1915, this gain amounting to approximately $500,000, or almost ninety per cent. During the month of April alone, twenty-nine brick residences were built in this city, sixty-three brick and steel garages, four brick warehouses and two brick factories, showing that the predominant building material consists of burned clay.

The showing made on the Pacific Coast in new building during the past month or so is none too good, this condition being reflected in the sale of clay products. Building operations are not above normal, altho much work is being contemplated for the summer months.

If You Are In Need
Of a superintendent or a skilled burner, make your wants known in the Classified Ad. Department.

YOU CAN'T FOOL A USER OF
HETTRICK BELTING

He knows that in actual everyday performance the Hettrick belt does its work with perfect ease. He knows it sticks — does not slip — and it lasts. He knows it is proof against water, oil, dust, sudden jerks, over-loading. He knows

NO BETTER BELT CAN BE MADE

HETTRICK CANVAS BELTING
BEATS THEM ALL

HETTRICK BROS. CO.
TOLEDO, OHIO

You won't have to worry about competition if you treat your clay with

R. H. Precipitated
Carbonate of Barytes

You can safely guarantee that your brick will be

Scum-Proof

You can get a higher price and influence architects to specify your product because Efflorescence is prevented absolutely.

But insist on the R. H. BRAND—it's dependable.

We have a complete line of high grade chemicals for the clay industry.

The Roessler & Hasslacher
Chemical Company
100 William Street New York
Chicago, Ill. Kansas City, Mo. East Liverpool, O. Philadelphia, Pa. New Orleans, La. St. Louis, Mo. Boston, Mass.

WHAT STEPS are YOU TAKING
to make the "WHEELER" available
for other work?
He is no longer needed for this simple job.

Elwell-Parker **SELF-LOADING** Electric Trucks

with one man, will successfully do the work of six men in most plants, handling clay products between presses, driers, kilns and yards or cars.
It will pay you to investigate—it has others.

THE ELWELL-PARKER ELECTRIC CO.
Main Office and Works CLEVELAND, OHIO

THWING HIGH RESISTANCE MULTIPLE RECORD **PYROMETERS**

Never Sleep

If the burner knows that his work is being

Recorded in Ink

every few minutes, he will stay **On the Job.**

Multiple Recorders reduce the cost of installation.

How Many Kilns Have You?

Thwing Instrument Company
437 North Fifth Street
Philadelphia

IN *the* WAKE *of the* NEWS

Being Brief Mention of a Host of Interesting Happenings in the Varied Fields of Clayworking

PERSONAL

George S. Shultz, a well known brickmaker of New York City, died at his home on April 30. Mr. Shulz was seventy-two years old and for twenty years acted as treasurer of the John B. Rose Brick Company of that city.

H. D. Brunning, who has been in the service of the Ohio State Highway Department for several years as an engineer, has severed his connection with the state to become a traveling engineer for the Ohio Paving Brick Manufacturers' Association, under James R. Marker.

Clay products manufacturers thruout the state of Indiana were grieved to learn of the death of John O. Spurgeon of Gas City, recently. Mr. Spurgeon was general manager of the Herbst (Ind.) Drain Tile Company for several years.

Firth Marsden, who has held important executive positions for several years with the Barrington Steam Brick Company and the New England Steam Brick Company at Barrington, R. I., has accepted a position with a new concern that is building a brick plant at Ashaway, R. I.

Tom Green, a member of the Green Brick Company of Sioux City, Iowa, recently addressed the Engineers' Club at its monthly dinner, held at the Jackson Hotel of that city. Mr. Green talked on the method of manufacturing brick in the vicinity of Sioux City and the uses to which it might be put.

B. H. Harris, vice-president and general manager of the Chicago, Milwaukee and Gary railroad, was the guest of the Brazil (Ind.) Chamber of Commerce recently on an inspection tour of the brickmaking plants of that city. Mr. Harris spoke highly of the progress being made at that point and predicted a large north and south railroad thru the city if the industry continues to increase as it has in the past few years.

Louisville (Ky.) friends of Owen Tyler, formerly one of the leading building supply dealers in that city, have learned with interest of his return to New York from France, where he had been engaged in delivering supplies to the French government. He is displaying to friends in New York the cap of a big shell picked up behind the French lines at Verdun. It is of steel and brass, weighs two pounds and was made for a 245 millimeter gun. The end of a wire shows that the cap was fused.

A. E. Livingstone, an officer of the Louisville (Ky.) Builders' Supply Company, has bought out the interests of the other officers of the company and is now in complete control. A. E. Bradshaw, formerly president, lives in Indianapolis and was not actively connected with the company, while James O. O'Bear, who was secretary and treasurer, will resume the practice of law at Delphi, Ind. Houston Fairleigh, who was associated with the Union Cement and Lime Company, has joined the sales force of the Louisville Builders' Supply

Company. Mr. Livingstone states that the outlook for the summer's business is excellent.

ALABAMA

The Southern Clay Manufacturing Company, Chattanooga, Tenn., has purchased the Graves Paving Brick plant at North Birmingham, Ala., and will at once begin making wire-cut-lug brick at that plant. The Southern Clay Manufacturing Co. already has plants at Robbins, Tenn., and Coaldale, Ala.

ARIZONA

The Tucson (Ariz.) Pressed Brick Company has been compelled, by a steadily increasing number of orders, to enlarge its plant. Recently a new battery of six down-draft kilns, with a capacity of 200,000 brick each, was built and, at the present time, more than two hundred feet of drying shelves are being constructed. The draft for the new kilns is supplied by a stack sixty-five feet high, an arrangement that is in accordance with the most modern methods of brick plant construction. Quintus Monier, president of the company, is especially proud of the many shades of brick that can be produced at his plant and, judging from the number of orders that he is receiving, it seems that others are also satisfied with the product.

COLORADO

After the fire that completely destroyed the plant of the Golden-Fairview Pressed Brick Company of Golden, Colo., a month or so ago, it was necessary to reorganize the company and secure more capital. The officers of the new organization that were elected are James Knox, president and general manager; Charles Hall, vice-president, and Paul Brown, secretary and treasurer. The name of the concern was changed to the Golden Fire Brick Company and the office moved from Denver to Golden. A sales-office, however, is at present being maintained at Denver.

CONNECTICUT

In the vicinity of Berlin, Conn., brick yard laborers, many of whom are Italians, have formed a union and are preparing to press demands for more pay and shorter hours.

Practically all of the brick plants in the vicinity of Hartford, Conn., have resumed operations, the last of these being opened on May 1. Higher wages are being paid laborers than ever before, but even this is not a sufficient inducement to secure all the help that is required. Most of the manufacturers have large orders on hand which they are anxious to fill at once, and the lack of labor is getting to be a serious matter.

The brick plants in the vicinity of Berlin, Conn., are at present very busy, some of the yards having as many as 500,000 unburned brick on hand. Altho the scarcity of labor threatened for a time to cause considerable trouble in obtaining sufficient help to operate the plants, this annoying element has been overcome. Judging from the amount of building going on and being contemplated in the territory that these plants serve, an excellent year is anticipated.

ILLINOIS

Two large plants at Danville, Ill., have very creditable exhibits at the local chamber of commerce. These are the Western Brick Company, operating one of the largest building brick plants in the United States, and the Danville Brick Company, with a capacity that is rated high among paving-brick manufacturers.

BUFFALO 450 Rooms 450 Baths
DETROIT 800 Rooms 800 Baths 200 room addition building
CLEVELAND 1000 Rooms 1000 Baths

Comfortable

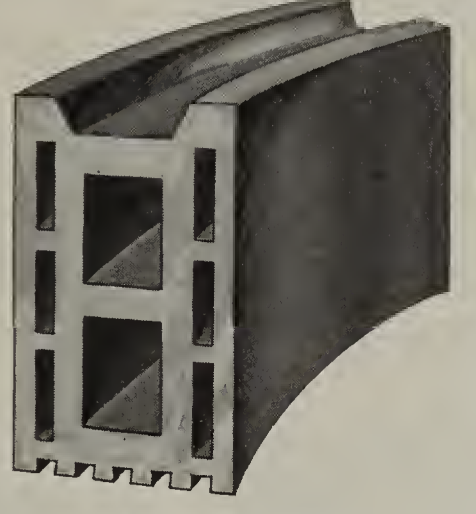
YOU'LL be comfortable—bodily and mentally—in a Hotel Statler, so far as it is in the power of a hotel to make you so.

Comfort isn't wholly a matter of a good bed, easy chairs, restful surroundings and cleanliness. At a Hotel Statler you get those things—at their best—and you also get a *service* that keeps your comfort in mind. Further, it is an efficient service, that relieves you of petty worries about telegrams or laundry or baggage or callers.

That service is for every guest, whether he spends $1.50 or $20 a day.

You get more for your money—unquestionably—at a Hotel Statler. Ask anyone who has ever stopped with us.

HOTELS STATLER
BUFFALO - CLEVELAND - DETROIT
Rates from $1.50 Per Day


MAIN WALL BLOCK
The main wall blocks occupy a space in the wall 10 inches high and 12 inches long. Wall six inches thick, 3 air spaces

"Bats" Will Not Make a Salable Silo

You know that the "best is the cheapest" in silo construction, as in other things.

We can prove that we have the **best**.

Our silo improvement features have a clean record back of them—they have been thoroughly tried out. We guarantee them.

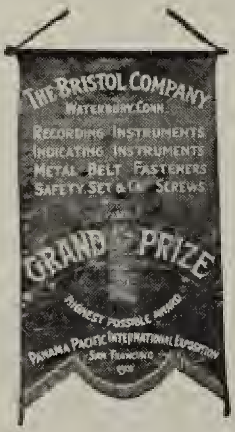
With the silo block illustrated (we have a special door jamb block), used with our patented galvanized steel door frames and Red Cedar doors, an air-tight construction is secured; strong and lasting—steel reinforced horizontally and vertically. We also furnish a safe ladder.

To get next to our selling proposition, address:

KALAMAZOO TANK & SILO CO.
KALAMAZOO, MICH.

Bristol's Pyrometer Installation

For many practical applications of electric pyrometers it is desirable to have the furnace temperature indicated at the furnace operator's post of duty, and a recorder installed in the office of the superintendent. This combination indicating and recording unit of Bristol Pyrometers, as shown above provides for both these requirements. Highly recommended for brick kilns.



Write for Bulletin 205

THE BRISTOL CO.
WATERBURY, CONN.

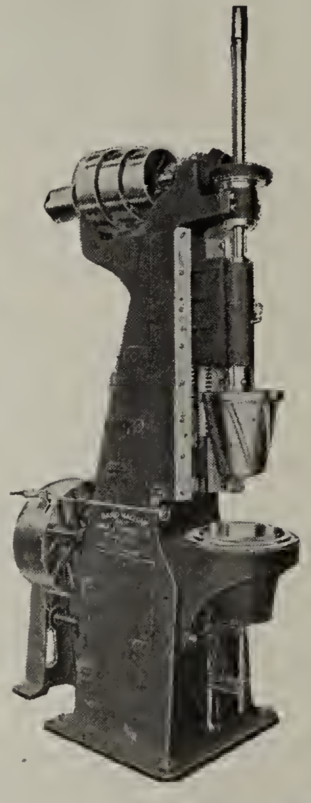
BRANCH OFFICES
BOSTON NEW YORK CHICAGO
PITTSBURGH SAN FRANCISCO

Flower Pots—
A Profitable Bi-Product

No matter what the nature of your clayworking plant, it is no doubt possible for you to add Flower Pot manufacturing with very little additional outlay.

Often you wish you had some way to keep Jim Smith or Jack Jones busy all the time, don't you? Well, here's the solution: put in a

Baird
Flower Pot Machine



Easy to operate, absolutely accurate. Makes any regular size pot desired.

Send us a sample of your clay and let us show you what our machine will do.

Baird
Machine & Mfg. Co.
54-56 Jefferson Ave.
Detroit, Mich.

The Gem City Pressed Brick Company of Quincy, Ill., of which John T. Hummert is president, reopened its plant recently after being closed since January 1 of this year. A large amount of business is anticipated by the company. The orders that have accumulated during the shut-down are sufficient to keep the plant busy for some time to come.

An order recently published by the Illinois Public Utilities Commission effects a reduction of ten cents per ton on brick shipped out of Decatur, Ill., to certain towns in the state over the Illinois Central Railroad. The reduction came as a result of findings of the commission showing that another carrier was transporting the same product a distance of six miles farther for a charge ten cents lower per ton than the then existing Illinois Central rates.

It is rumored that A. W. Gates of Monmouth, Ill., together with a number of McDonough county (Ill.) capitalists, are planning the construction of a large clay plant at Colchester, Ill. Mr. Gates, who has been engaged in the manufacture of clay products for thirty years, and who is at present an officer of the Monmouth Clay Manufacturing Company, recently addressed a mass meeting at Colchester upon the possibilities of such a plant in that city, and as a result, a local committee was named to assist in selling stock and organizing a company.

The St. Anne (Ill.) Brick and Tile Company is planning to install a large motor, together with several smaller ones, to be used with individual drive, to replace the steam engine previously used at this plant. A new round, down-draft kiln was also recently added to the equipment. These improvements have come as the result of an increased demand which has exceeded the existing capacity of the plant. U. A. Cote, its owner and manager, states that he hopes that the increased production which will follow the making of these changes, will be such that all orders can then be filled without delay.

INDIANA

A large clay gathering machine was installed recently at the plant of the Hydraulic-Press Brick Company, Brazil, Ind. This machine is being used to "win" clay from a large circular pit near the plant.

The American Sewer Pipe Company of Brazil, Ind., recently doubled its capacity by erecting a large fireproof building northwest of the plant. Five new kilns have been completed and two more are in the process of construction, making a total of twenty-six kilns at this plant. The company has been working two shifts of men recently to take care of the increased amount of business being received.

The Brooklyn (Ind.) Brick Company has received an order to furnish 175,000 hard brick for the new school house that is being erected at New Salem, Ind. The company also is shipping 120,000 brick to Marion, Ind., to be used in the construction of the Rutenber Electric Company's plant. W. R. McKown, Indianapolis representative of the company, says that business is more than satisfactory at the present time.

IOWA

A settlement of labor difficulties on the clay plants operating in the vicinity of Lehigh, Ia., has been brought about with the result that three hundred striking laborers have returned to work. The plants involved in the dispute with the workmen were the National Sewer Pipe and Tile Company, the Lehigh Sewer Pipe and Tile Com-

pany, the Lehigh Clay Products Company and the Plymouth Clay Products Company.

KENTUCKY

Out of nine jobs for the paving of streets in Louisville, Ky., bids for which were opened on May 11 by the Board of Public Works, six are to be of vitrified brick construction.

The commissioners of Campbell county, Ky., have awarded to Edward Knepfle the contract for paving the lower end of the waterworks road with vitrified brick, on his bid of $16,986.20.

At Ashland, Ky., the Red Brick Company has leased the old plant of the O'Kelly Brick Company and will manufacture brick at the rate of about 50,000 a day. A number of improvements will probably be made at this plant in the near future.

Leo M. Parsons of the Tyler Building Supply Company, Louisville, Ky., reports that the company is doing an excellent volume of business and that the long-popular "Hytex" lines are still very much in demand. Car shortage is giving the company some trouble in shipping from the Indiana plants.

The Louisville (Ky.) board of trade is behind a movement looking toward the raising in Louisville of a fund of at least a million dollars to be used in aiding new manufacturing enterprises to locate there. In view of the fact that there is much high grade clay in the vicinity of Louisville, it is expected that some new brick manufacturing concern will get a portion of the assistance that will be rendered.

Of immediate interest in Louisville clayworking circles is the contract which has been let for the completion of the group of buildings which the Speed estate has begun on Guthrie street, between Fourth and Third streets. The new structure is described and pictured in the architect's plans as a four-story brick and terra-cotta building. It is generally expected that the Tyler Building Supply Company, which furnished the terra-cotta for the original building, manufactured by the Atlantic Terra Cotta Company, will get the order for the second structure. When completed, this group of buildings will be exceedingly attractive.

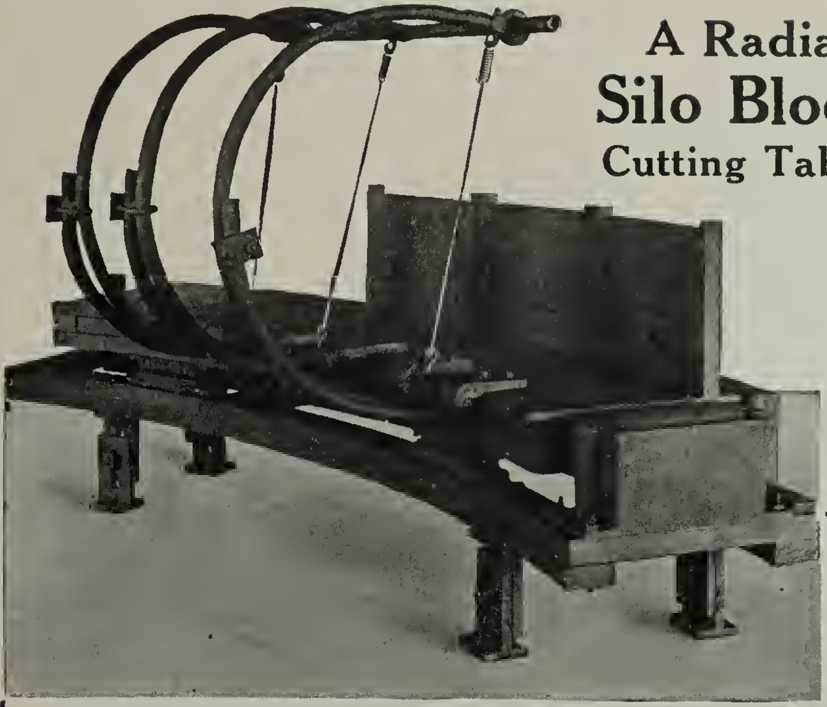
During the convention of the Kentucky Master Plumbers' Association, which was held in Louisville during the present month, one of the most attractive and interesting displays was that of the P. Bannon Pipe Company, limited to the various kinds of sewer-pipe and tile manufactured by that company. It was a complete and attractive display with A. P. McDonald, salesmanager for the company, in personal attendance most of the time. In addition to this exhibit for the plumbers, the delegates were invited to visit the company's plant, several hours being set aside by the convention for this purpose. Mr. McDonald guided the visitors thru the plant where they saw how sewer-pipe and tile are manufactured.

MARYLAND

The Chesapeake Terra Cotta Company of Baltimore, Md., has leased for a term of years, a suite of offices on the second floor of a building at No. 9 East Lexington street in that city, where in the future its offices will be located.

MASSACHUSETTS

Preparations for a season's run have been completed and the brick plants in South Hadley, Mass., have



A Radial
Silo Block
Cutting Table

The Farmers Will Build
Hollow Clay Tile Silos

Are you prepared to manufacture—silo block—cheaply?

Get in touch with us and find out about this modern cutter.

You can't afford to be without it.

WRITE US TODAY—NOW
CRAWFORD & McCRIMMON CO.
Brazil, Indiana

HOOK'S
Latest Patented System
For Burning Your Clay Products
Means Success for You

Scores of Brick and Tile Manufacturers in the UNITED STATES and CANADA are burning their ware successfully with HOOK'S LATEST IMPROVED UP and DOWN DRAFT KILN.

In one section of OHIO, where Hook's Latest Patented Kiln is best known, one of our Representatives took orders for over 20 kilns in 3 days. This ought to be convincing evidence. Do not be deceived—insist on having HOOK'S Latest Patented Kiln.

SOLD ONLY BY
Ohio Kiln Company
Vigo, Ohio

Slant grates—open boxes

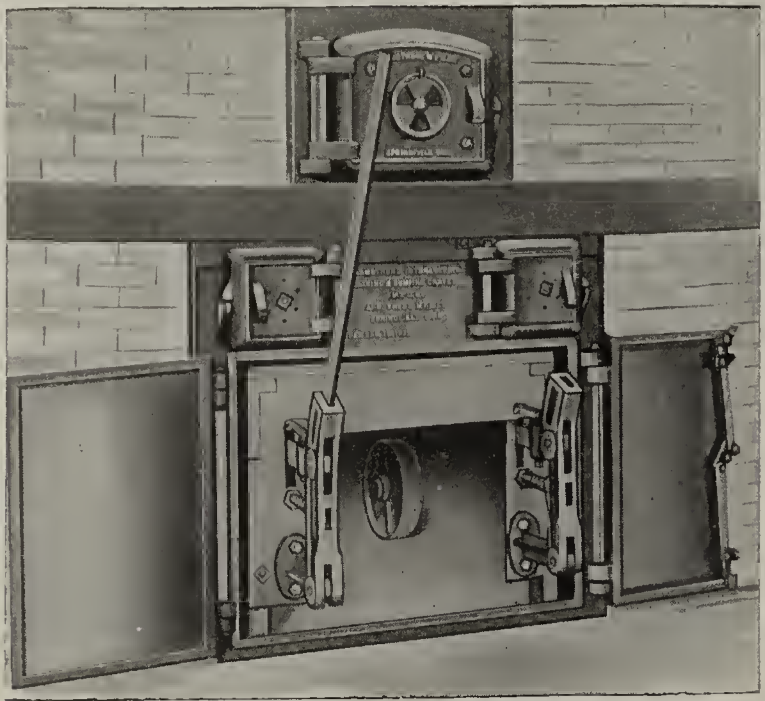
The Old Way

The doors are always open or not in use. The flame flares out of the furnaces, the fire boxes are cleaned by periodical destruction of the fuel bed. Enormous quantities of heat and fuel are wasted.

Shaking grates—closed boxes

The New Way

The doors may be kept closed as they are equipped for proper draft regulation. The fuel bed is always kept clean by the easily worked shaking device. Maximum heat is utilized with the Armstrong Kiln Grate.



We want to tell you more about these grates

The Armstrong Manufacturing Co. - Springfield, Ohio

POSTERETTES

200,000 of the "Build with Brick" posterettes have been used by brickmakers throughout the country. As many pieces of mail and express matter have carried the "Build with Brick" slogan to a vast army of prospective homebuilders.

Here is the second edition—the stamp advertising paving-brick. It tells a story that carries a moral —and that moral means better business for the men who make paving-brick.

How about using some of them—now?

Printed in THREE colors

Gummed and ready to stick on your letters, envelopes and packages.

$1.50 per thousand postpaid

Send your orders to

BRICK AND CLAY RECORD
445 PLYMOUTH COURT CHICAGO

started capacity operations. Here, as in other eastern cities, the labor question threatened to be very troublesome for a while, but contrary to predictions, a sufficient supply of help is now available, in many cases the number of applications outnumbering the positions available.

A five-mile electric power line is being extended to the plant of the Westfield (Mass.) Clay Products Company from the Westfield Gas and Electric Company. This line will carry 6,600 volts and will supply the company with 200 h. p. for dynamos which will be installed about June 15, at which time it is expected that the new power line will have been completed. Two 25 h. p. motors are being installed, as is also one of 150 h. p., to take the place of the steam power plant which previously furnished 150 h. p. for the entire plant.

The brick plant operated by W. A. Bailey and C. L. Sauter at Springfield, Mass., reopened recently with a force of fifty men. Altho an increase in wages of almost thirty per cent. was paid to the workers upon their demand, conditions point to a very successful and profitable season. An order for 1,000,000 brick is now being filled for the West Boylston Company, a textile concern of Easthampton, Mass. This, together with several other orders now on hand, will necessitate a maximum production for some time to come.

Brickyards in western Massachusetts generally resumed operations on May 1, and most of them are now working to capacity. The scarcity of laborers, which was felt in some sections of New England, was not experienced so much in this section, altho increases in wages were granted for the most part in order to keep the help. The laborers at the Willimansett yards of the Hampden Brick Company struck to secure wage concessions but the difficulty was soon adjusted. In South Hadley and vicinity brickmakers have many orders on hand which foreshadows a busy and profitable season.

MISSOURI

The Universal Clay Company of Oskaloosa, Mo., is enlarging its plant preparatory to manufacturing common and face-brick. New driers and machinery of the latest design are being installed which will increase the capacity of the plant to 150,000 brick per day. C. W. Reid is general manager of this company.

MONTANA

It is reported that a new brick and tile plant is soon to be started at Roundup, Mont., as the result of a number of tests made of a coal-mine shale and fire-clay that were recently discovered at that point by M. S. Storer, a veteran brickmaker of Ohio, Nebraska and Washington. Extensive tests, said to have been made on the available material, are reported to have shown conclusively that the clay will make a very high grade product. Already a company is being formed and some of the stock has been subscribed.

NEBRASKA

The Avery plant of the Hydraulic-Press Brick Company, located six miles south of Omaha, Neb., has begun operations and is running to capacity in an attempt to fill all of the orders which it now has on hand.

NEW HAMPSHIRE

Brick manufacturers in Rochester, N. H., and vicinity are experiencing considerable difficulty in securing enough help. Many local men, who have heretofore worked at the brickyards, have returned to their native land with the result that the labor supply is unusually low.

NEW YORK

The Prudden-Winslow Company of New York, N. Y., dealers in paving-brick, have moved their offices from 30 E. 42nd street to the Foster Building, located at 280 Madison street.

The Central Clay Products Company, North Tonawanda, N. Y., of which G. E. Mecusker is manager, is doing a good business in hollow-tile and drain-tile. Recent improvements and a change in management are working wonders for this plant, its business having been materially improved in recent months.

The Solry Tile Manufacturing Company has been incorporated at New York, N. Y., with a capital stock of $100,000. In addition to its tile business, this company will handle granite, limestone, stone and other building materials. The incorporators are A. B. W. Hahn, P. F. Solan and B. F. Reilly, the latter being a resident of Brooklyn, N. Y.

Hudson River brick plants are, with few exceptions, now in full operation, after several weeks which were spent in cleaning up the yards and getting the machinery in shape for a busy season. Altho a high price is being received for brick which are being manufactured in this territory, yet an increase of about thirty per cent. in wages has become necessary in order to secure the required labor, wiping out a large part of the profits.

OHIO

The Waynesfield (Ohio) Brick and Tile Company is planning the addition of several kilns to its equipment.

The Uhrichsville (Ohio) Fire Clay Company is remodeling its plant to increase its capacity one hundred per cent.

The Builders' Sales Company, Cleveland, Ohio, has closed a contract for all the hollow-tile fireproofing to be used in the new addition to the Hotel Hollenden.

Edward D. Murray has secured the contract for paving Miami street in Urbana, Ohio, with brick, on his bid of $18,342.50 for the east side and $24,883.00 for the west side.

The Gaddis-Harrison Brick Company, a jobbing concern located in the Brunson Building, Columbus, Ohio, reports the best business in the history of the concern during the month of April.

The Richard C. May Tile Company has been incorporated at Columbus, Ohio, by Richard C. May and others. The capital stock of this company is placed at $5,000.

The Claycraft Brick Company of Columbus, Ohio, has just booked an order for 350,000 smooth buff-colored brick to be used in the construction of the plant of the Beatrice Creamery Company, Chicago, Ill.

The Hanover (Ohio) Brick Company, the successor to the Hanover Red Brick Company, which was formed several months ago, is operating to full capacity and is finding a ready sale for its product. The brick made at this plant have an enviable reputation thruout Ohio.

Car shortage is not as pronounced at many of the Ohio brick plants as was the case several weeks ago. The efforts of the railroads to provide a better supply of cars for shippers of clay products has aided in clarifying the situation. But the manufacturers predict a shortage of cars later in the year.

Favorable weather has brought the only remaining factor necessary for building activity in and around Cin-

HARD digging? Yes—but what's a great deal *more* important, this picture shows *thorough* digging being done. This particular "Marion" is at the plant of The Fredonia Brick Co., Fredonia, Kansas, but you can find its splendid performance duplicated in practically every section of the country—for

The "MARION" is the CLAYWORKER'S SHOVEL

and whenever owners of brick-plants begin to get down to brass tacks on the question of their operating costs, and the efficiency of their plants, you'll generally find them inquiring about the right sized "Marion" to do the work.

Our special Brick-Makers' Book is full of sound, interesting *facts.* Glad to send yours if you request Catalog A120, addressing

Marion

We Make Excavating Machinery of Every Description

Branches:
Atlanta, Chicago, New York, San Francisco, Seattle

THE MARION STEAM SHOVEL COMPANY

Established 1884 **MARION, OHIO**

119

Your Ware Is As Good As You Make It!

To make a merchantable class of ware it devolves upon you to perfect each single phase of the manufacture—from the selection of the clays to the sorting of the finished product.

The correct measuring and mixing of two or more raw clays is of tremendous importance.

Financial success or financial failure depends upon the ability of your men or machines to standardize the batch.

To depend on your men to measure, to guess, to mix with shovel—or slide gate and chute is to have the batch run wild.

A dependable machine is your only alternative, and that machine is the Schultz proportioner—it measures, mixes and tempers. Set it and leave it. It does its work well.

Get details from

A. L. Schultz & Son
Clay Plant Engineers
1675 Elston Ave.
Chicago

Since the first time we said: "The Standard Natural Draft Steam Drier is the most satisfactory drier for the average yard and the average clay," more than twenty-five years have passed by—and proved it true.

We have a book for brick manufacturers afflicted with drying troubles—our catalog, sent for the asking. Write for it. Address: The Standard Dry Kiln Co., 1540 McCarty St., Indianapolis, Ind.

There is a man—

a manufacturer of fireclay products; he has used Canton Kiln Grates for four years.

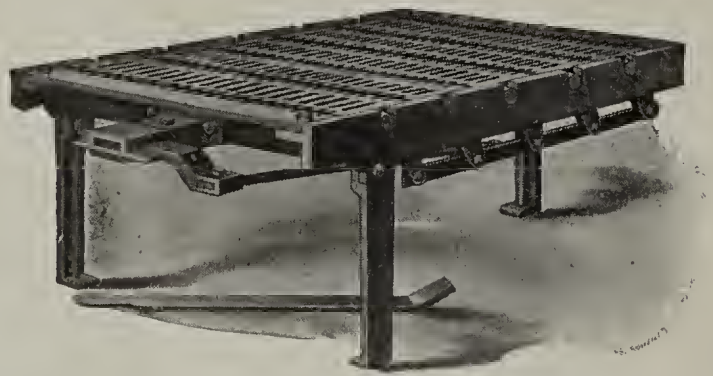
This man saved 30% of his burning costs each year in the first three years.

Today, in the fourth year, he claims and is accomplishing a saving of—40%.

Are you neglecting an opportunity? In all fairness to yourself, to your trust, to your company—is it right for you to any longer neglect an investigation of Canton Kiln Grates?

We have dozens of sets in kilns. We will furnish you a set on a trial basis.

Write that letter to us—now.



The Canton Grate Co.
1706 Woodland Ave.
CANTON OHIO

cinnati to attain its normal volume for this period of the year. Local brick plants are, without exception, running to capacity, with a ready market for their entire output. The prospects are for as busy a season as has ever been experienced in this vicinity.

J. M. Adams, general manager and secretary of the Ironclay Brick Company of Columbus, Ohio, which operates a plant at Shawnee, reports a good demand. He states that the trade is not as good as a week ago, but believes the quietude to be only temporary. There is every indication for an active building season in this territory.

The Canton (Ohio) Board of Education has decided to let the contract for the completion of the Daniel Worley school to the Indiana Engineering and Construction Company of Fort Wayne, Ind., on its bid of $124,000. This company is now engaged in the construction of the first unit of the building on a contract let some time ago. The face-brick used in the building will be made by the Belden Brick Company.

Heavy sales are reported by H. H. Camp, president of the Camp Conduit Company, Cleveland, Ohio, but it seems to be getting more difficult to handle this increased business, because of the car shortage. Mr. Camp says that his plant is only able to use about seventy-five per cent. of its loading facilities now. No trouble is experienced with labor at this plant, as the men are satisfied with their wages and working conditions.

One of the drawbacks to an active trade in face-brick is the extreme shortage of labor at many of the plants in the Buckeye State. The effect of this condition is just now being felt and is curtailing the output at many of the factories. The cause for the shortage is the general prosperity in other lines of manufacturing, these having attracted the labor from the brick plants. Then again, the world war has caused many laborers to return to their native lands.

Ordinances are now before the city commission of Dayton, Ohio, providing for the paving of Salem, Lakeview, Livingston, Brighton and Bickham avenues with brick, and resolutions have been introduced covering several other thorofares. The city is to do a considerable amount of street paving during the coming summer, and much the greater part of it will involve the use of brick. The experience of Dayton with that material has been very satisfactory.

The Contractors' and Builders' Supply Company, a material concern doing business in Hyde Park, near Cicinnati, has been taken over by the Murdoch Coal Company, and has consolidated both under the name of the Marsh-Murdoch Company with a capital stock of $50,000. Carlisle Murdoch is president of the new company, George J. Marsh vice-president and treasurer, and James P. Marsh secretary. The company handles a full line of building materials. including sewer-pipe, and is planning to take on face-brick, as well as common-brick and hollow-tile.

The long, drawn-out dispute between contractors and the bricklayers' union at Youngstown, Ohio, with regard to wages and working conditions has been settled in an agreement reached recently by which the wage scale remains the same as before, save in a few instances, but the men are to receive a half-holiday every Saturday instead of on alternate Saturdays, as was the case last year. All of the contractors signed the agreement, thus making it certain that this disturbing factor has been put out of the way safely, leaving no obstacles for what promises to be an unusually busy season.

Robert C. Mitchell, general manager of the Farr Brick Company, Cleveland, Ohio, who has been ill with pneumonia for several weeks, is now back on the job. A matter of chief interest now being considered by this concern, as well as by other Cleveland clay products manufacturers, is the reported disturbance among the teamsters. Statements that certain points have been conceded to the union are denied by Mr. Mitchell for the employers. "The brick manufacturers voluntarily gave an advance in wages to the teamsters," said Mr. Mitchell, "but we have refused to recognize the union. The men are reported to be satisfied with the new conditions."

Hollow-tile will play an important part in construction work in Cleveland, Ohio, during the next few months. Contracts are about to be let for several large hotels, office buildings, semi-public structures and other work. The new Hotel Olmstead, a $750,000 structure, which will be twelve stories in height and erected on leased land, was fireproofed by the Camp Conduit Company. Other work for which bids have been asked includes the new hotel to be erected on the site of the old Forest City House in the Public Square, which will cost $350,000; the Hotel Winton, another costly building, additions to the Gilsey House, the Colonial Hotel and others.

The plant of the Shawnee (Ohio) Flash Brick Company was sold at auction at the courthouse, Columbus, May 6 to Daniel Mauger, John E. Koontz, Jacob Enlows and L. W. Tussing, four of the stockholders, for $25,100. There were only two bidders for the property and the order of the court was to sell to the highest bidder. The property consists of fifty-three acres of land, held in fee simple, the ownership of clay on two adjoining tracts of one hundred and sixty-seven and one hundred and eighty acres respectively, and a modern plant. The appraised value was $73,532. Samuel P. Doney was receiver for the property from February 11, 1916, when the plant became the subject of litigation. It has not been in operation since August, 1914. Plans for reorganization have not as yet been formulated. In all probability something will be done towards this end in the near future.

Ohio State Highway Commissioner Cowen has written a letter to T. E. Davey of the board of administration, asking for a price on prison-made brick. This request has come after continued correspondence between the prison administration board and the state highway commissioner's office, during which time an effort has been made to have the highway department use the paving-brick made by prisoners at Junction City. So far, however, efforts along these lines have been unsuccessful, and while the request for prices of prison-made brick was immediately complied with, it is said that this is no indication that the highway department means to purchase brick from the state. More than 2,000,000 brick are ready for shipment at Junction City, altho no "pavers" have been made for more than eight months. During all this time efforts have been made to have the highway commissioner provide for the use of prison-made brick in new road contracts. Within the past few weeks several requests for quotations on these brick have been received from municipalities, and it may be possible that the board will sell a large quantity in this manner.

OKLAHOMA

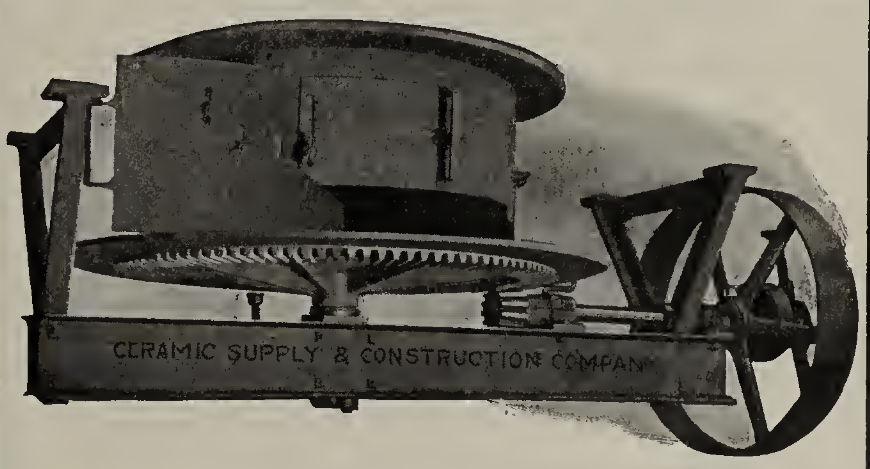
The Ada (Okla.) Brick and Tile Company is planning to treble its present capacity during the coming summer. Since this plant is fortunate in having an unlimited supply of what has been pronounced an excellent grade of

A New Sewer Pipe Truck

that is built in three different sizes:
No. 1. To handle 18"-20" and 24" pipe.
No. 2. To handle 27" and 30" pipe.
No. 3. To handle 33" and 36" pipe.

This Truck will be manufactured with the same care and skill shown in our Sewer Pipe Presses, Wheelbarrows, Dry Pans, etc. Send at once for descriptive matter.

The Toronto Foundry & Machine Co.
Toronto, Ohio



"Bolt It to the Bin"

The Columbus Feeder

for automatically feeding

Crushed Clay to Dry Pans and
Pulverized Clay to Pug Mills

is fast coming into general use. There's a reason. Let us show you—furnish the machine on trial.

Send for Circular.

Ceramic Supply & Construction Co.
Columbus, Ohio

shale, the proposed increase in capacity will in no way endanger the supply of raw material.

An excellent demand for brick is reported by Frank C. Nicholson, president and manager of the Muskogee (Okla.) Vitrified Brick Company and of the Union Brick Company of Iola, Kan. Two new kilns have been installed at the Muskogee plant with a capacity of 350,000 each, and one sixty-ton steam shovel. The capacity of this plant is now 1,500,000 common-brick and 500,000 face-brick per month, while at Iola, the same number of commons is made with 300,000 face-brick every thirty days. At the present time, however, despite the large increase in production, both companies are thirty days behind on orders.

ONTARIO

The Jasperson Brick and Tile Company of Coatsworth, Ontario, recently increased the capacity of its plant and added a waste heat drier. All of the plants in this section of Ontario are very busy filling orders.

PENNSYLVANIA

The First National Bank of Bangor, Pa., recently purchased the property of the Berkeley Brick Company located at New Providence, N. J., for the sum of $10,800 when it was offered at a sheriff's sale.

An unusually active demand is reported by plants in the Pittsburgh (Pa.) district. The Kier Fire Brick Company of that city is receiving a large amount of business due to the extensive building operations now under way. It is pleasing to note that the prevailing building material in that metropolis is brick and hollow building tile.

Business is reported as being of excellent volume at the offices of the National Fire Proofing Company, Philadelphia, Pa. Included in a large number of orders is one for material to be used in the construction of the DuPont High School at Wilmington, Del., and another for the new high school at Shenandoah, Pa. These contracts amount to nearly $10,000.

A large number of the small towns in the vicinity of Philadelphia, Pa., are adopting brick for street paving, many orders have been received recently for "pavers" to be used at these points. A $23,000 contract for vitrified brick is pending in Lebanon, and many other communities are preparing to expend large sums on brick paving. The outlook for paving-brick manufacturers in this vicinity is very encouraging, and a general feeling of optimism is prevalent.

RHODE ISLAND

The new buildings being erected at the plant of the Barrington (R. I.) Steam Brick Company, to take the place of those recently burned, are rapidly nearing completion. The yards will soon be in full operation.

TENNESSEE

Altho the capacity of the Kingsport (Tenn.) Brick Corporation has been increased three times during the past few years, additional kilns are now being added to the existing battery in order to further increase the output of the plant, a step that has been made necessary by the heavy demand for this company's product. An unusually large territory, including seven states, is ordinarily served by this plant, but the present output is not sufficient to take care of the demand at Kingsport alone.

TEXAS

The Acme Brick Company has been incorporated at Fort Worth, Tex., with a capital stock of $150,000 to manufacture clay products. The incorporators of this concern are William Brice, W. R. Bennett, A. E. Newell and others.

A new kiln with a capacity of 200,000 brick is to be

The Price of Coal

subject to such uncertain conditions as exist at the present time, demands that you keep a watchful eye and an open ear upon this big factor of your operating expense.

The price of coal will not be any lower than it now is, and will undoubtedly go much higher within the next few months, because of the material increase in miner's wages and mining supplies.

THE BLACK DIAMOND

Each weekly issue of THE BLACK DIAMOND treats with conditions as they arise, and tells of the probable bearing they will have upon the future price and supply of coal.

Considering the small cost of but 6c a week ($3.00 a year), THE BLACK DIAMOND is the cheapest, safest and most satisfactory form of fuel insurance a clay-product manufacturer can carry.

Follow the path of live and progressive brick and tile makers everywhere, and become a regular reader and subscriber to THE BLACK DIAMOND,—**for over 30 years the coal trade's leading journal.**

Write now for a sample copy.

THE BLACK DIAMOND

111 MANHATTAN BLDG.
CHICAGO, ILL.
NEW YORK PHILADELPHIA PITTSBURGH

built at the plant of the Abilene (Tex.) Pressed Brick Company in the near future. This new addition to the plant, it is estimated, will cost about $2,000, work upon which will be started at once.

While the population of Bartlett, Tex., is only 2,000, yet considerable progressiveness is shown in the recent action of the city council in awarding a contract which calls for the laying of 27,000 yards of vitrified brick pavement. Bonds for this improvement, which will include all of the streets in the business district and an appreciable amount of the residence district, were voted last year.

UTAH

The Ashton Fire Brick Company of Ogden, Utah, is making a number of improvements at its plant, the cost of which, together with that of additional land which was purchased, amounts to $150,000. One of the largest brick stacks in the state has just been completed at this company's plant. It is one hundred and ninety feet high with an inside diameter at the top of nine feet. The stack rests on a base twenty-six feet square. It is estimated that about 380,000 brick were used in the construction of the stack which supplies the draft for seven kilns. New railroad connections are being planned that will give the plant a larger territory. J. P. Cahoon and J. B. Cahoon, his son, are the president and manager of the company.

VIRGINIA

The Vanderberry Tile Company has been incorporated at Norfolk, Va., with a capital stock of $1,000. R. N. Vanderberry is president of this concern, and H. W. Roberts is secretary and treasurer.

WEST VIRGINIA

At the annual meeting of the Thornton (W. Va.) Fire Brick Company recently, the following officers and directors were elected: President, Thomas J. McVay; vice-president, John R. Hardy; general manager, D. R. Potter; directors, E. B. Tampleman, John L. Ruhl, John Koblegard and W. R. Alexander.

POTTERY NOTES

A Resume of the Activities of the Potters and Some Mention of Their Plans for the Future

The matter of securing sufficient skilled labor to operate the potteries to full capacity is causing general ware manufacturers more than usual concern. That the available help in the industry is far below normal, is generally admitted. Boys, it is being pointed out, will work only when "the spirit moves them" and, as a result of this condition, juggermen are unable to turn out near enough ware. Such a condition in the clay shops has produced a marked shortage of ware, and many orders are being held up as a result. Manufacturing potters located outside of the East Liverpool (Ohio) district have entered that center with the idea of securing a number of men, but have gone home with little to show for their efforts. The closing of a pottery at Grafton, W. Va., relieved the situation to a slight extent, for the workers who were engaged in that plant immediately returned to the Wheeling (W. Va.) and East Liverpool districts where they secured positions merely for the ask-

THE
UNDERWOOD
PRODUCER GAS
BURNING SYSTEM
(Patented)

—is one of the biggest factors in "business preparedness" so far as the clay-products industry is concerned, because it protects against the constantly increasing burning costs with which the industry is beset.

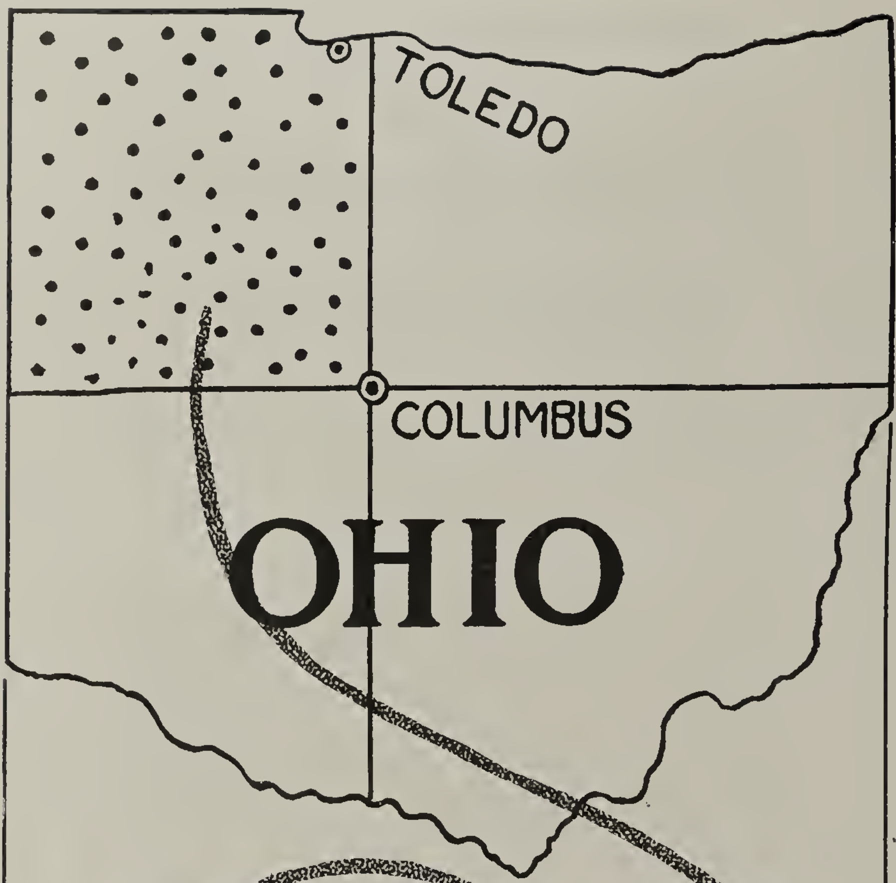
—the clay products manufacturer who clings to the same old inefficient methods of burning, no matter how efficient the balance of his equipment may be, will sooner or later find himself disturbed by the "army" of General Competition.

—right now is the time for you to begin to prepare. Call in our board of expert engineers—let them study your needs —then they will lay out a plan of action for you.

—all we ask is that you approach this successful method of burning, with a mind open to conviction. We have facts and figures that cannot help but convince you.

—we will go anywhere to talk it over.

THE MANUFACTURERS
EQUIPMENT COMPANY
"Everything for the Clayworker"
DAYTON, OHIO, U. S. A.
GEO. H. SMITH, Western Representative
510 Reliance Bldg., Kansas City, Mo.



Everybody wants in on a GOOD THING as soon as it is

A PROVEN SUCCESS.

A few years ago in this section of Ohio ONE COMPANY installed our system —today

SIXTY-FIVE COMPANIES

have installed and have our Hook Kilns in successful operation.

Isn't this proof enough that Hook Kilns are efficient **TIME** and **FUEL SAVERS?**

The **JUDGMENT** of these companies is that "Hook Kilns are **GOOD.**" **YOU** can reduce **YOUR MANUFACTURING COSTS** by taking advantage of this **OPPORTUNITY.**

Join the ranks of **LOW-BURNING-COST PRODUCERS. Write to us now.**

HOOK PATENT KILN CO.

VIGO, OHIO

Canadian Office
250 Dufferin St. Toronto, Ont., Can.

HOOK KILNS ARE OPERATED ALL OVER THE CENTRAL WEST.

EFFICIENCY—DURABILITY—ECONOMY

ing. It is admitted in some quarters that the National Brotherhood of Operative Potters is unable to supply the demands being made upon it for skilled labor. Clay-shop workers, kilnmen and decorators are very scarce in the western district. Several hundred more men could be put to work at once, if they were available.

It would be no great surprise to many to learn that the selling prices of American pottery are about to make another advance, judging from the way in which the cost of raw materials continues to rise. Clay importers now declare that English china clays will cost from five to six dollars more per ton in the near future than when contracts were placed a few months ago. This means that china clay will cost from seventeen to eighteen dollars per ton laid down in the East Liverpool (Ohio) district as against from eight to ten dollars a year or so ago. It has been pointed out also that flint has been advanced —five per cent. being added to the base of all invoices.

The former plant of the Brunt Electric Porcelain Company, which has been dismantled of all machinery, is expected to be converted into a manufacturing power building, where a number of small industries are to be housed under one roof. This was the original electric porcelain plant in East Liverpool, Ohio, operations, being stopped there when the consolidation of interests at Parkersburg, W. Va., was completed. George Brunt, who operated this property, is now manufacturing tile in the former plant of the Worthington Pottery at Columbus, Ohio.

The report is current that a new company is about to be formed by East Liverpool and East Palestine (Ohio) capitalists for the purpose of leasing the present idle plant of the Ohio China Company at East Palestine. The names of those interested in this move are being withheld. The Ohio plant has been idle for several months. The property is in good physical condition and reasonable amounts of raw materials are stored at the plant.

The brief strike of about seventy-five packers employed in the Sebring (Ohio) potteries was ended on May 6 without any advance in wages being granted by the manufacturers—$3.25 for a nine-hour day remaining the rule. The manufacturers agreed, however, to have the foremen of the packing departments decide what is dusty straw and what is not, this being one of the chief complaints made by the men.

Buyers continue to enter the market, and they have come to the point where they are anticipating their future wants by placing orders for delivery as late as August. There is little, if any, hope of obtaining immediate deliveries, as it is an admitted fact orders which were placed last December are still unfilled in more than one instance.

Business is good, is the report of the Louisville (Ky.) Pottery Company, and as a consequence, the plant is operating to capacity. K. P. Snyder, one of the officers of the company, was absent from the city during the early part of the present month, inspecting the company's clay mines.

The Next Issue
of this magazine will be dated June 6—three weeks from the date of this issue—which is a regular quarterly occurrence. We hope to have the next number of sufficient value to compensate for the extra wait.

U. S. Plans Extensive Foreign-Trade Investigations

The most extensive investigations into foreign-market conditions ever undertaken at one time by the Bureau of Foreign and Domestic Commerce, Department of Commerce, will be under way soon after the beginning of the new fiscal year in July. These investigations will be aimed at the newer and more undeveloped markets lying well outside of the fighting zone, especially those in South America, China, India, Africa, and Australia. Twelve different lines are to be investigated and fifteen distinct examinations to find suitable agents for the work have been announced for some time in May.

For South America, agents are being sought to study and report on markets for construction material and machinery, fancy groceries, furniture, glass and glassware, jewelry and silverware, motor vehicles, paper and printing supplies, railway supplies, and stationery and office supplies. In the Far East, Africa, and Australia a study will be made of the markets for boots and shoes, electrical goods, motor vehicles, and railway supplies. One agent is also sought to look into possibilities for American commercial and industrial investments in South America and another to make a similar study in the Far East.

The difficulty the Bureau has experienced in getting suitable men for its foreign investigations illustrates the lack of trained men for foreign commercial work which has so often been called to the attention of Americans in the last year. There are plenty of men capable of sizing up market conditions in any part of their own country, but there is a different story to tell when a man is wanted to study the prospects of selling goods in a foreign country. For South America, for example, the Bureau of Foreign and Domestic Commerce wants men who can speak Spanish, who understand their particular line well enough to learn the essential facts so necessary to American exporters, and who, when in possession of these facts, can write them up in clear-cut, logical, convincing fashion. Such men are scarce. For investigations in the Far East a foreign language is not essential, altho extra credit will be given in the examination for a knowledge of French, German, or Spanish.

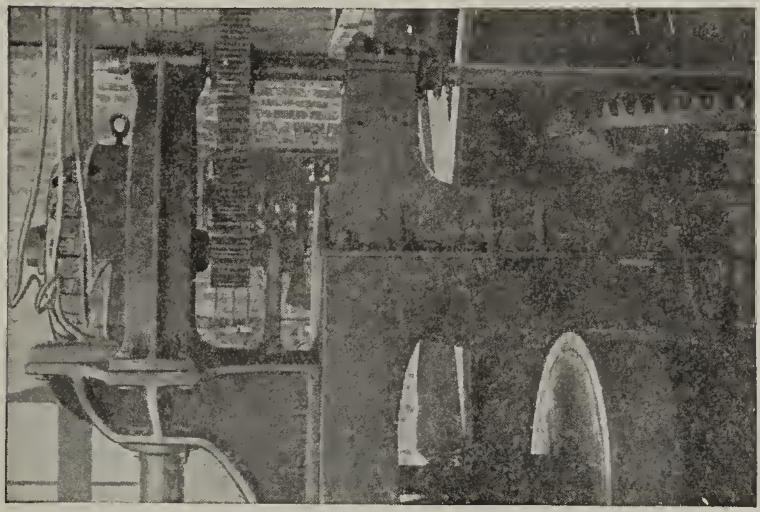
Drainage For Wetness or Drought

The Ontario Agricultural College, Guelph, is sending out notices calling attention to the importance of proper drainage of farms and to the assistance rendered by College, when requested. The following information is taken from one of their circulars:

The great factor in moisture control is drainage, natural or artificial. Few farms are sufficiently drained by natural means. Nearly all require some artificial drainage. The problem then is, "Where shall we place our drains?" "How deep shall we put them?" "What size of tile shall we use?" The position of the drains depends largely on the slope of the field; the depth, on the kind of soil; the size of tile, on the extent drained and the fall or grade given the drain. If any farmers are uncertain about these points or anticipate any difficulties the Ontario Agricultural College will send a drainage surveyor who will, if necessary, prepare a map of the farm showing the location of the drains, the size of tile to use and the grades and depths of the drains. The cost for these services will be the traveling expenses of the surveyor, and as several surveys are made on one trip the charge is seldom over three dollars for each survey.—"The Contract Record."

Who Pays?

for the wasted power to drive the line shaft when several of your machines are idle?—YOU—but you can stop this waste with—



Westinghouse Motor Driving a Dry Pan

Westinghouse Individual Motor Drive

Individual motors make each machine an independent unit. You do not have to furnish energy to drive fifty feet, or more, of shafting to operate a single machine.

A card will bring full information.

W WESTINGHOUSE ELECTRIC

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

Sales Offices in all Large American Cities

310

The Wise Man of FATE

Fate is Going to Announce a New Device

¶ Shortly we are to make known to the clayworking world a new device—an addition to one of the Fate machines that adds still greater efficiency to what has been considered a perfect contrivance.

This New Device Revolutionizes Hollow Block Making

¶ It cuts down labor cost by eliminating men at the off-bearing end of the auger—it automatically does what men now are forced to do by hand—it gives a greatly improved product.

The Announcement Will Be Made in This Paper June 6

¶ In this announcement a picture of the new device will be shown as it is actually working in the plant of a well known clayworker, and a full description will be given, with some data that will cause all hollow-block manufacturers to sit up and take notice.

In the Meantime—If You are Interested And Cannot Wait—

¶ Write in to us and we will give you some advance information—if you will just mention this announcement.

¶ At the same time—if you want information about any of the other Fate machines or devices, check off the list at the left.

The J. D. Fate Co., 240 Riggs Ave., Plymouth, Ohio.

We are interested in the following machines or devices and ask that you send us special printed literature on the same, without obligation to us:

(List Items Here)................

(Firm Name)........................

(Your Name)........................

(City)........................

(Street)........................

(State)........................

USE COUPON

The J. D. Fate Co.

240 Riggs Avenue

Plymouth, Ohio

MACHINERY *and* EQUIPMENT

Descriptions of Machinery and Accessories and Detailed Announcements that Our Advertisers Believe will Interest Our Readers

---

"Electric Power is Best"

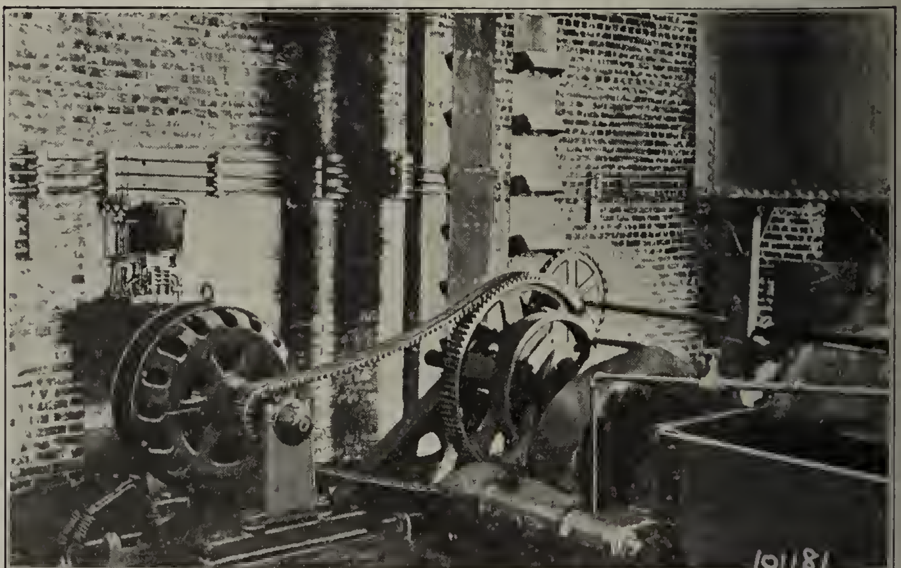
More brick plants every year are learning the distinct advantages to be found in the use of electric power. But there would be even a much larger percentage adopting motors if they could only have a chance to visit some of the plants that are electrically equipped.

For the benefit of those who cannot spare the time to make personal visits, there is the alternative of getting first hand information from brother manufacturers who have electric installations. Here is a chance to learn something in this connection from a southern brick manufacturer—a man who is well known in the trade for both his progressiveness and the high quality of his products.

L. L. Stephenson of Birmingham, Alabama, has a strictly modern plant at Lovick, Alabama, where he makes Oriental, rough texture face-brick. In 1913 his plant was completely destroyed by fire, but instead of allowing this to daunt him, he accepted it as an opportunity to put into practice certain ideas he had gained from his past experience, study and observation. He decided to electrify thruout. How good his judgment was is best evidenced in his own words in a letter he wrote recently relative to the use of electric power. This is what he said:

> "My experience since 1913, when my plant was rebuilt, is that electricity very much simplifies and facilitates in the manufacture of brick. Altho I am using power generated by water, since the experience I have had, were I located where the water power was not available, I would arrange to generate my own electricity for power.
>
> "Practically all of my motors are Westinghouse manufacture. The machines all belt driven, except a 14 ft. pugmill, which is driven by a Morse Silent Chain.
>
> "One great advantage with electrical equipment is that you can set a machine anywhere with no reference to being driven from a central line shaft."

Westinghouse motors are so well known that it would seem superfluous to say anything about them. They have, for many years, been doing splendid work in brick plants all over the land. This has brought to the Westinghouse Electric & Manufacturing Company a wealth of knowledge which they are glad to place at the disposal of clay-products manufacturers. Their home office is in East Pittsburgh, altho they have branches in every important city.



Westinghouse Motor, with Morse Chain Drive, Driving Pug Mill at L. L. Stephenson Plant

No matter what you think you know about electric drives, it will be well worth your while to get in touch with the Westinghouse Company.

Dry House Door Carriers

In order to keep the heat from leaking out, or cold air leaking into the tunnels, a tight door is of course necessary. A loose series of doors also allows enough air to drift in to seriously check the draft pull from the kilns, or decrease the power of the draft to carry the moisture-laden air out of the tunnels.

To strive for an "almost perfect" control of the drying tunnels is very necessary as a great deal depends on the efficiency of the dryer. If the dryer is delayed in its work the whole plant is held up immediately; or if ware is set wet, then a longer burning time is necessary and the "hold up" comes later but it comes sure.

The Dry Kiln Door Carrier Company of Indianapolis, Indiana, have perfected a carrier for dry house doors that keeps them absolutely tight, yet is simple and easy in operation.

To determine the necessity for these on your plant, go to the hot end of your dryer and note the hot blast coming from every crack—a great waste of power and heat, besides making it uncomfortable for the men. At the cold end it may be found that the draft is "in," and this of course robs the draft of a certain amount of lifting power required to carry the saturated atmosphere out of the tunnels. Make this your next study on the plant.

Popular Machinery Man Undergoes Operation

H. H. Fate of The J. D. Fate Company, Plymouth, Ohio, underwent a successful operation on Tuesday, May 9th, at the Huron Road Hospital, Cleveland, Ohio. The last report received indicates that he is in fairly good condition, and evidently doing as well as can be expected considering the short time that has elapsed since the operation.

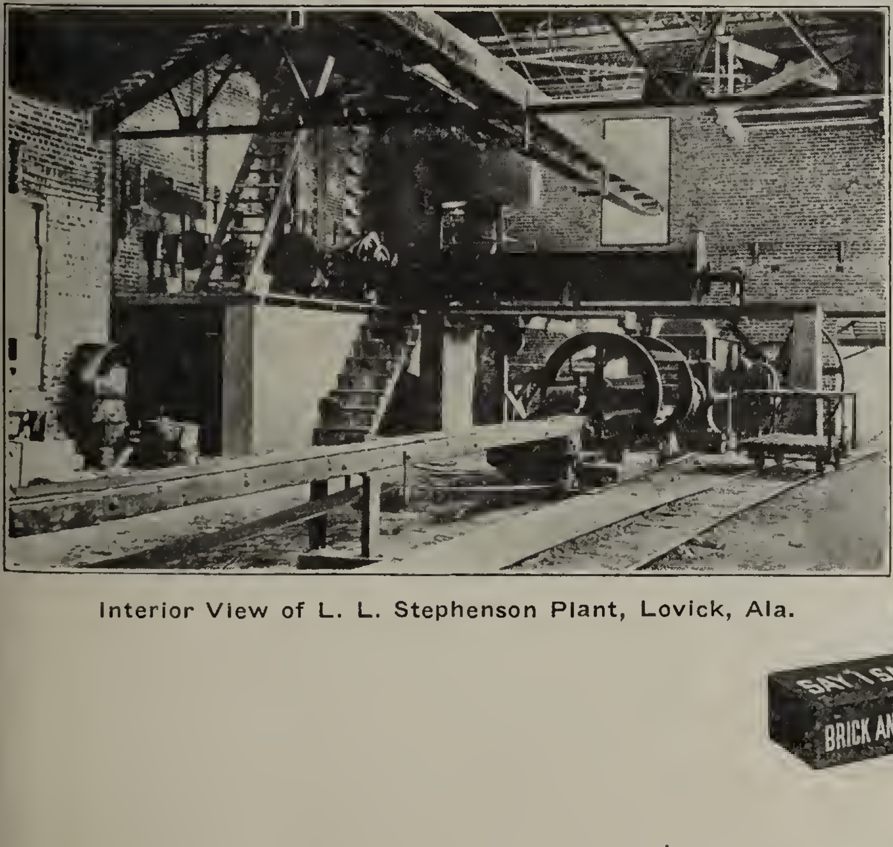
As Mr. Fate will probably be confined to his bed for a month we feel safe in saying that friends wishing to visit him will be welcome.

Twenty Years of Cling-Surface

This year marks the Twentieth Anniversary of the Cling-Surface Company, Buffalo, N. Y., manufacturers of the well-known belt treatment.

During those twenty years many schemes for stopping belt slip have been born and have died, whereas Cling-Surface has always given the same uniformly beneficial service. As a result, the Cling-Surface Company is larger and better known than ever.

Innovations and suggestions for stopping slip continue to ap-



Interior View of L. L. Stephenson Plant, Lovick, Ala.

Fredonia Brick Co. Hauls 100,000 Brick a Day at a Cost of $2.85

The Fredonia Brick Co. of Fredonia, Kans., is hauling 100,000 green brick on an 800-foot haul, and doing it at a cost of only $2.85 per day—which is cheaper than a steam hoist could do it.

It Is Done With

The Plymouth Gasoline Locomotive

This is possible because the Plymouth eliminates useless labor, runs cheaper than steam and does away with a lot of other cost items.

The Plymouth at the Shale Bank of the Fredonia Co.

Read What Fredonia Brick Company Says:

The following letter from the Fredonia Brick Co. gives some exact cost figures on the Plymouth:

"We have a haul of 800 feet and the Plymouth has a daily duty of 100,000 six and a half pound green brick in a day of ten hours.

"It costs us $1.75 per day for an ordinary day laborer to run the locomotive, 90 cents for the six gallons of gasoline required, and 20 cents for the half gallon of lubricant.

"This is considerably cheaper than our former methods, we getting a cost reduction in labor, fuel and per ton mile."

The Plymouth Can Do the Same for YOU

If the Plymouth can do this for the Fredonia Brick Co. it looks reasonable to suppose it can also for YOU. Why not investigate, at any rate, and prove it to your own satisfaction—since it costs nothing to investigate?

GET BOOK OF FACTS

We have a booklet that gives complete cost data on scores of Plymouth locomotives in actual use in clay plants and elsewhere. You should have a copy to compare with the cost of your haulage. Use coupon at the right and get your copy free.

The J. D. Fate Co.
240 Riggs Avenue
Plymouth - - Ohio

The J. D. Fate Co.
240 Riggs Ave., Plymouth, Ohio.

Send us The Plymouth Book of Facts, this request not to obligate us.

(Firm) ....
(Your Name)..................
(City) ....
(Street) ....
(State) ....

SAY "I SAW IT IN BRICK AND CLAY RECORD"

CYCLONE BOILER GRATES

Sold on 90 Days' Trial

These are the six points of superiority:

1. Even distribution of draft.

2. No fuel gets into the ash pit.

3. Locks level.

4. Burns cheap fuel.

5. No fingers to burn off.

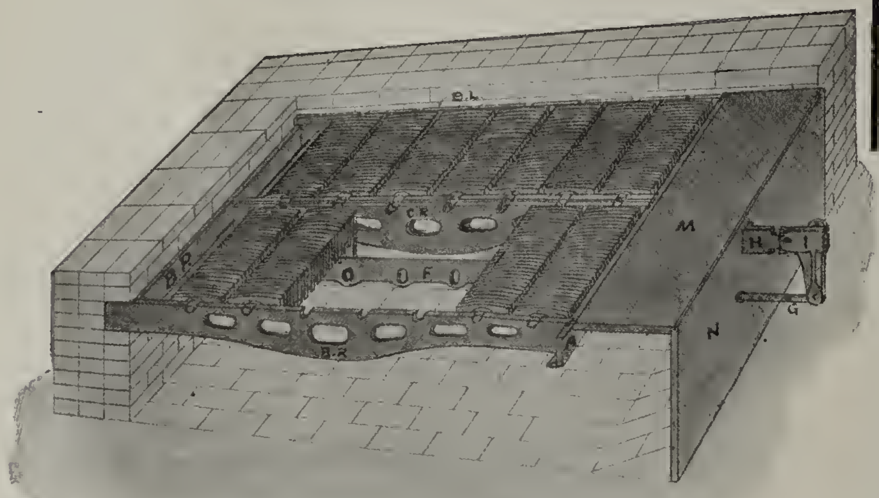
6. Impossible to warp.

In practical every-day service they have proved that these claims are in no manner overstated.

We are enabled to sell on the trial basis because our confidence in the grates is substantial, they do produce more heat at a great deal less cost—and we know it.

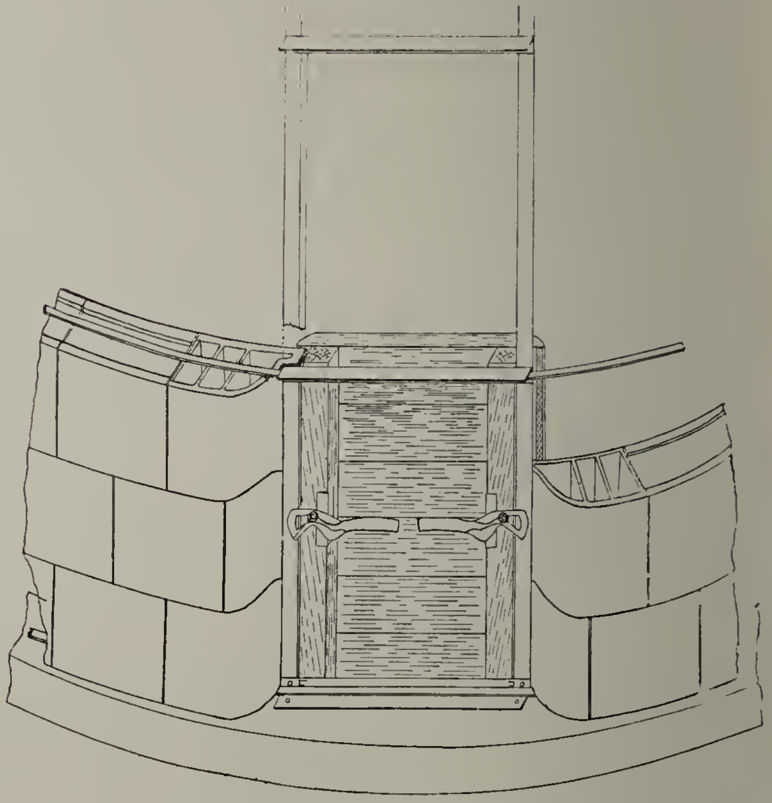
Ask us to prove it to you.

Cyclone Grate Bar Co.
Buffalo, N. Y.



pear in trade papers, as any reader perhaps knows. Everything has been and still is recommended for slip prevention all the way from castor oil, neatsfoot oil and shellac to high belt-bursting-tension.

A correspondent in the Wood-Worker recently inquired about "boiled linseed oil" as a belt treatment. The idea came from the London Times Engineering Supplement, where it was claimed that boiled linseed oil is good for belts because it makes them "dry and hard." Dry and hard is just what belts "shouldn't be." Cling-Surface gives belts the proper oil consistency and makes them "pliable"—not hard. It is the hard dry belts that slip. Pliable Cling-Surface-treated belts do not slip.



"Kalamazoo Klinch" Silo Construction

Another belt operative said he made his belt slipless by applying a "lime paste." Yet another sketched a picture of a belt with "coil springs on it" for the purpose of keeping the belt tight on the slack side.

Investigators, once in a while, make "thorough" tests on belts in general without even thinking about the condition of the belt. They use dry, untreated belts. They claim, and truly, that humidity affects belts. But, Cling-Surface belts are immune to dryness and wetness. Had the investigators used Cling-Surface on the belts they tested they would have drawn different conclusions.

Cling-Surface is free from rosin, gritty matter, sticky matter, dry matter, and acids of all kinds. Chemists and engineers the world over have tested it and have found it a natural food for belts; it surrounds every tiny fibre, and permits slack, economic operation without worry on the part of the belt or machine operator.

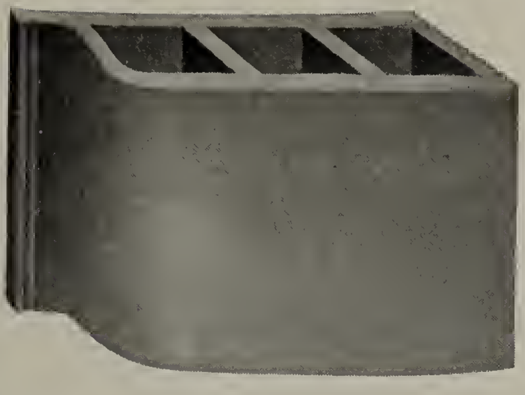
Valuable Silo Information

There are three principal features in silo construction that must be incorporated before any method of silo construction can be called a real success. First it must permit of simplicity in both the making of the block and the erection of the silo. Secondly, there must be rigidity so as to stand the pressure from within, and wind storms from without. Thirdly, the material must be such as absolutely prevents the entrance of air during fermentation.

It is because it embodies these principles that the "Kalamazoo Klinch" glazed tile silo has gained such universal favor. A glance at the cuts shown on this and the following page will convince anyone that this is a simple block, easily made and erected, and that the door frame and holding hoops give great strength.

These features are the result of the work of a corps of men that have been with the Kalamazoo Tank & Silo Company or years, and have grown up in the business.

It would be much to the interest of present, and future, clay silo builders to get the literature of this company, Kalamazoo, Mich. They are making some unusually attractive contracts whereby clay silo builders are permitted to make this style of silo — including the use of the patented door and frame work, and ladder. Also they will contract to take any portion of your output and pay you a cash price that will give you a nice profit. It will pay you to write them for particulars.



Door Jamb Block

A Belt That Won't Wear Out

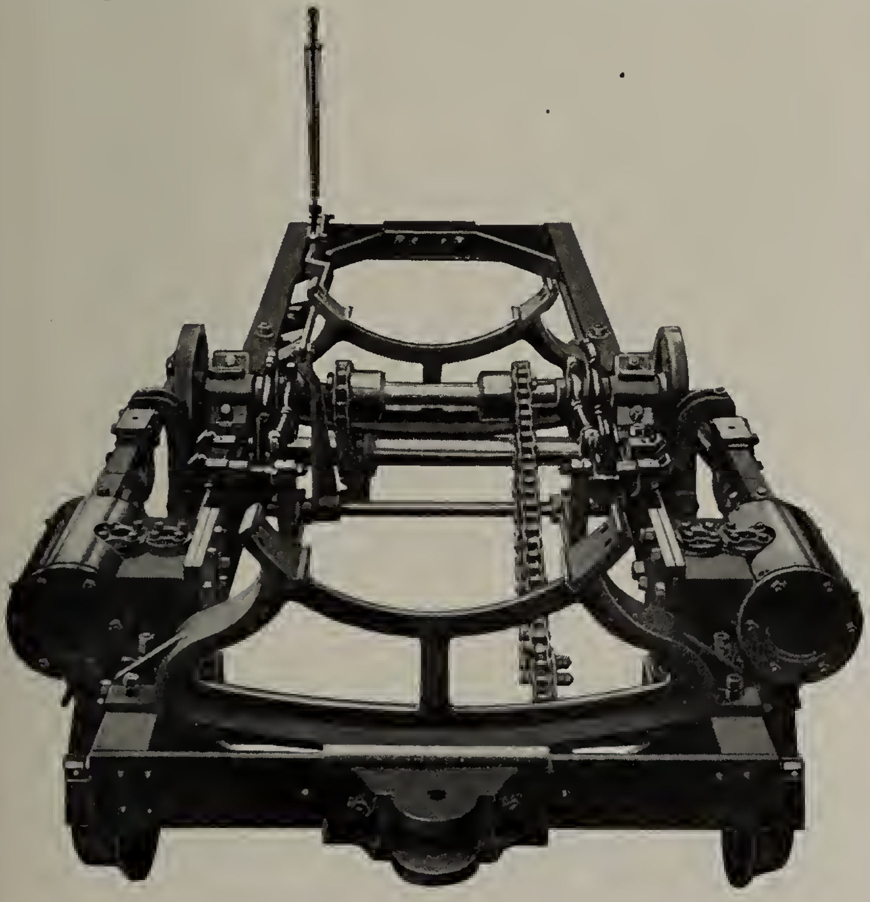
It would seem to be unnecessary to add anything to the statement of the Bessemer Fire Brick Company of Birmingham, Ala., whose letter is quoted here, except to emphasize the longevity of Gandy Belts. As one brick man put it recently: "There is only one fault to find with Gandy Belts —they seem to last forever." The Bessemer letter follows:

> "Your Mr. Wood stepped into our office a few days ago and asked if we were users of the Gandy belting. We replied in the affirmative for 'twenty-seven years.'
>
> "Our main driving belt at our Bessemer plant is 8 ply 26 inch, and has pulled our plant for twenty-seven years, during which time it has not been shut down except for repairs to the machinery. In the early part of this month, the driving belt pulled in two at the old lace holes where we formerly used leather lacings; later, the belt hooks.
>
> "We have an order with your people for 4 feet of 8 ply 26 inch belt. We intend cutting out the portion of belt damaged by the lace holes and substituting the 4 feet and fastening with belt hooks. This is the first time this belt ever gave way in the manufacture of 140,000,000 fire brick. Be prompt in furnishing this 4 foot section, and when we are in need of a new belt, we will place the order with you."

Everywhere that clay products are made, Gandy Belts are known, used and praised. They are on sale in every section so that purchase can be made in your locality, altho samples and prices will be cheerfully sent to readers of "Brick and Clay Record" who write direct to The Gandy Belting Company, Baltimore, Maryland.

The Economical Dewey

Hauling clay from the pit to the machine room must be accomplished at the very minimum of expense because no mat-



The Driving Mechanism of the Dewey Locomotive

SATISFACTORY
COAL
SERVICE

Just read the letter

Rutledge & Taylor Coal Co.,
St. Louis, Mo.

Gentlemen: Replying to your inquiry of January 7th with regard to the Rutledge & Taylor Livingston coal. We are pleased to advise that we have used this coal for about four years and find that it is excellently well suited to our purpose.

This coal fires freely, with a long flame and a small amount of clinker and ash.

We also find its effect on the kiln is not so severe as other coals which we have used, and that the service given us by your company is very excellent.

Trusting that this gives you the desired information, we are

Yours very truly,
The Kankakee Tile & Brick Co.,
SDK/FAS By S. D. Knight.

Every single element of service—Rutledge & Taylor Service—is mentioned in that letter—

Livingston Coal is excellently well suited—because it fires freely, has a long flame, a small amount of clinker and ash, is not severe on the kiln—and lastly—the service is characterized—EXCELLENT.

NOKOMIS or LIVINGSTON COALS

Shipped everywhere west of Indiana on the Big 4, C. & E. I. and I. C.

Rutledge & Taylor Coal Co.
St. Louis, Mo. **Chicago, Ill.**

This "QUAKER CITY" Belt has been in constant use for 11 years

You who are used to belting going bad in one to three years, think of the record of this belt on a mule drive.

Service and economy are the natural results of uniformly high quality.

Everywhere, engineers recognize these goods as standard—

P. P. P. ROD PACKING

Reg. U. S. Pat. Off.

EBONITE SHEET PACKING

EBONITE PUMP VALVES

We have a mighty interesting proposition for plant owners and superintendents who desire to increase efficiency and reduce costs by **standardizing** the Mechanical Rubber Goods used.

FREE Write for a copy of our Pocket Catalog, 62 pages—6x3¾-in.—illustrated in colors. There's a lot of mighty valuable information in this handy little book. Ask for Catalog 4-D.

Quaker City Rubber Co.

PHILADELPHIA 629 Market St.
CHICAGO 182 W. Lake St.
PITTSBURGH 211 Wood St.
NEW YORK 207 Fulton St.

ter how it is done the clay itself is no better at the machine than in the pit. The only consideration is to keep the haulage cost down, and that's just what the Dewey Locomotive does.

The Dewey 5-ton Industrial Locomotive is so light in weight that it is, in many plants, run on the lightest rail made —and in some cases, on wooden rail. Track and track foundations are matters of very light expense, because any track that will carry a two-cubic-yard clay car is substantial enough for this locomotive.

The Dewey is chain driven (see illustration) and it develops full tractive power under any condition and takes with ease grades that would stop a direct-connected type of locomotive. The cylinders are high above the rail and away from dust and mud—they are in plain view and easily accessible.

The Dewey is also slow speed and cannot be run at excessive or dangerous speed by a reckless or incompetent operator.

A glance at the illustration showing the driving mechanism will convince you that the Dewey is easy to operate and easy to keep in good condition. Any man on the plant can operate the Dewey—it doesn't require a licensed engineer.

The Dewey is truly a clay plant locomotive. Write to Dewey Bros., Goldsboro, N. C., and let them tell you about it.

Shaking Kiln Grates

Canton shaking kiln grates are described and illustrated now in a brand new circular.

These grates have proven their worth on every type of burning operations. A part of the proof is given below in an excerpt from the circular.

"The general trend of thought is toward a closed furnace— that is, a so-called box furnace—equipped with horizontal shaking grates. What could be more natural or sensible? How many of us would equip our boilers with the furnace now in general use on the kiln? How long would we tolerate the waste of fuel and heat that comes from unburned and therefore useless fuel, discarded with the ashes?

"Under ordinary circumstances, it is difficult to control the bed of coals, clinkers form in enormous wads, side walls of ash boxes are pried loose by the strenuous use of the necessary clinker bar. When the clinkering operation is proceeding, there are few firemen skilled enough to prevent great fluctuations in the heat of the furnace proper, and the consequent chilling and heating up of ware, that comes during cleaning and after cleaning, when the furnace is reloaded or choked with fresh fuel.

"Nearly six years of continuous service with Canton Kiln Grates has demonstrated the following:

A saving of from 25 to 40% in fuel. A wonderful saving in the cost of brickwork in the fire-box. Reduction in labor of firing and cleaning. Heat to which firemen are usually subjected eliminated, therefore attracting a better grade of workmen. Absolute control of oxidation, reduction and heat flow. The burning of cheap coal, reducing fuel bill and rendering the plant independent of coal seizure by carriers, in times of labor trouble. Stability; a record of over five years in burning high grade fire brick without replacing a single grate bar. Grates made to suit any size fire pocket."

A letter to the Canton Grate Company, 1706 Woodland Avenue, Canton, Ohio, will bring to you full information.

The Murphysboro Paving Brick Company, Murphysboro, Ill., is installing the McManigal Preheating System at their plant, two kilns having already been equipped.

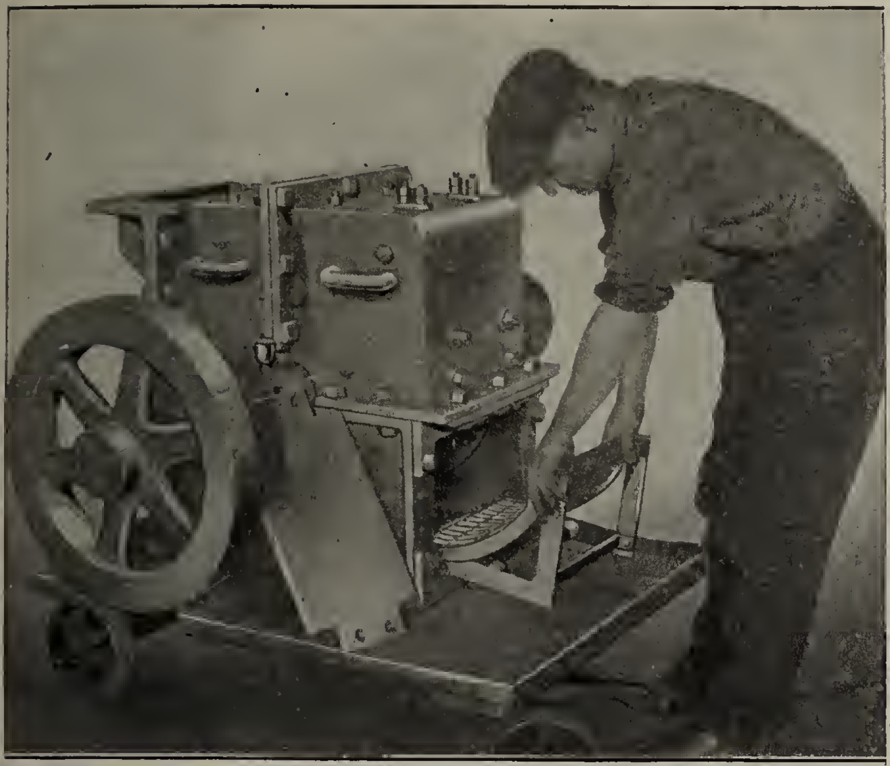
The Screens Slide Out Like Drawers!

"I need a few tons of clay crushed right away, John, so stop pulverizing that shale, and get to work on the clay!"

"All right, Mr. Smith, I'll pull out the screens, and in five minutes I'll be ready to start work on the clay."

This screen arrangement, which allows one man to remove or insert the screens within a few minutes, is a feature of the K-B Pulverizer that makes it such a practical crusher for clay plants. There are many times when you are pulverizing grog or shale, and you wish to change to clay or some other material with different screening requirements. The K-B Pulverizer has screens of various designs for work with different materials. They are mounted on triangular frames, and they slide just like drawers into both ends of the lower casing. One man, without assistance, can pull out or slide in the screens in less than five minutes.

However this is only one advantage of the K-B Pulverizer. It is built entirely of steel, and in addition it is lined throughout with specially hardened steel plates which protect the frame from all wear.



The Screens are Easily Inserted or Removed

The manganese steel hammers, by a clever device, are made adjustable to compensate for wear. Thus the product can be kept uniform, and the service of the hammers is increased fourfold.

The power expenditure of this machine is remarkably low for its high capacity. In these days of high power costs, the saving of horsepower which the K-B effects, is a big item in the reduction of your operation expenses.

Another feature of this hammermill is that it will handle wet material. This makes it particularly useful in a clay plant. The slogan of the K-B Pulverizer is especially significant: "Built for Service and Durability."

The K-B Pulverizer Co., Inc., 86 Worth St., New York City, will be glad to tell you more about it.

Did You Get Your Copy?

Booklet No. 419, issued recently by E. I. du Pont de Nemours and Company, of Wilmington, Delaware, represents years of practical experience in the blasting of clay and shale banks. It was compiled after several months of exhaustive study of data by an engineer having intimate knowledge of the requirements of clay plants in this connection.

Each year clay-products manufacturers are learning that more attention must be given to methods that make for lower cost in the mining and digging of raw materials. Therefore a concern that spares no expense to show how to accomplish this work more efficiently and at less cost should be looked upon with great favor.

This book is free to readers of "Brick and Clay Record"—just ask for Booklet No. 419, "Explosives for Shale and Clay Blasting."

"Moving Material Indian File" is the title of a new booklet, No. 267, put out by the Link-Belt Company of Chicago, illustrating many types of elevating and conveying appliances. A copy will be sent to you without charge.

The Osgood Company of Marion, Ohio, have just issued a new pamphlet showing the Osgood 18 as applied to trench excavating. It shows the shovel in actual operation in trenching and also devotes considerable space to cost of operation and repairs.

Three Letters About Three Belts

IN 1909 we received this letter:

"We are operating 3 Gandy Belts on our main drives. One belt 30 inches wide and one 27 inches wide has been running for 14 years. One belt 30 inches wide has been running for 20 years. We are pleased to state that all of these belts are doing good work."

W. J. Dickey & Sons, Inc.,
Oella Mills, Baltimore, Md.

In 1912 this letter came to us: "The three Gandy Belts about which we wrote in our letter of July 22, 1909, are still running, and are still doing satisfactory work."

W. J. Dickey & Sons, Inc.,
Oella Mills, Baltimore, Md.

In December, 1915, came another report: "We are glad to state that the three Gandy Belts mentioned in our letter of March 25, 1912, are still running and prove satisfactory."

These reports—six years apart—on Gandy Belts, which had originally been running 14 and 20 years at the time the first was written.

If this is the sort of belt service you would like, decide now to specify Gandy, the original stitched cotton duck belting next time you order, and be sure to get *the* Gandy. Look for the Gandy trade mark.

Write for samples and prices.

The Gandy Belting Company
732 West Pratt Street
Baltimore, Md.
New York Branch—36 Warren Street

GANDY

Brick and Clay Record Buyers' Directory of Manufacturers of Machinery, Equipment and Supplies

See Table of Contents Page for Advertisers' Directory

Analysts and Chemists, Clay.
Ceramic Supply & Cons. Co.

Aerial Tramways.
Ambursen Co.
Broderick & Bascom Rope Co.

Babbitt Metal.
Cleveland Alloys Co.
Gerlock, H. W.

Automobile Trucks.
Armleder Co., The O.
Federal Motor Truck Co.
Kelly-Springfield Motor Truck Co.
Kissel Motor Car Co.

Barrows and Trucks.
American Clay Machinery Co.
Bonnot Co.
Brewer & Co., H.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Chase Fdry. & Mfg. Co.
Chicago Brick Machy. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Manufacturers Equipment Co.
Pettigrew Fdry. Co.
Steele & Sons, J. C.
Toronto Fdry. & Machine Co.
Gerlock, H. W.
Lakewood Engineering Co.
Wallace Mfg. Co.
Weller Mfg. Co.

Barytes, Carbonate of.
Gabriel & Schall.
Roessler Hasslacher Chem. Co.

Belting.
Cleveland Fabric Belting Co.
Gandy Belting Co.
Hettrick Bros. Co.
Main Belting Co.
Quaker City Rubber Co.
Sawyer Belting Co.
Scandinavia Belting Co.

Belt Conveyors.
Ceramic Supply & Cons. Co.
Cleveland Fabric Belting Co.
Gandy Belting Co.
Hettrick Bros. Co.
Link-Belt Co.
Main Belting Co.
Manufacturers Equipment Co.
Morse Chain Co.
Quaker City Rubber Co.
Scandinavia Belting Co.
Weller Mfg. Co.

Belt Dressing.
Cling-Surface Co.
Hettrick Bros. Co.

Belt Fasteners.
Crescent Belt Fastener Co.
Flexible Steel Lacing Co.

Belt Stretchers.
Cleveland Fabric Belting Co.

Boilers.
(See Engines and Boilers.)

Brick Conveyors.
Bonnot Co.
Brewer & Co., H.
Ceramic Sup. & Cons. Co.
Chambers Bros. Co.
Fate Co., J. D.
Link-Belt Co.
Manufacturers Equipment Co.

Briek Handling Machinery.
Mathews Gravity Carrier Co.

Brick Machines.
(See "Dry Press," "Stiff-Mud" and "Soft-Mud.")

Cables and Cableways.
Broderick & Bascom Rope Co.
Leschen & Sons Rope Co.

Cars.
Ceramic Supply & Cons. Co.
Chase Fdry. & Mfg. Co.
Continental Car Mfg. Co.
Fate Co., J. D.
Gerlock, H. W.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Orenstein-Arthur Koppel Co.
Pettigrew Foundry Co.
Standard Dry Kiln Co.
Toronto Fdry. & Machine Co.
Trautwein Dryer & Eng. Co.
Weller Mfg. Co.
Youngstown Steel Car Co.

Car Movers.
Marion Mach., Fdry. & S. Co.

Castings.
American Clay Machy. Co.
Bonnot Co.
Chambers Bros. Co.
Gerlock, H. W.
Link-Belt Co.
Manufacturers Equipmont Co.
Toronto Fdry. & Machine Co.

Cement Filler.
Lehigh Portland Cement Co.

Chains (Steam Shovel).
Woodhouse Chain Works.

Clay Feeders and Mixers.
American Clay Machy. Co.
Bonnot Co.
Ceramio Supply & Cons. Co.
Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Louisville Machine Co.
Manufacturers Equipment Co.
Marion Mach., Fdy. Sup. Co.
Schaffer Eng. & Equip. Co.
Steele & Sons, J. C.
Toronto Fdry. & Machine Co.

Clay Gatherers.
Eaglo Iron Works.
Lechtenberg Bros.
Sauerman Bros.
Schofield-Burkett Cons. Co.

Clay Steamers.
American Clay Machy. Co.
Schaffer Eng. & Equip. Co.

Clocks.
Hardinge Bros., Inc.
Newman Clock Co.

Clutches.
Hill Clutch Co.
Schultz & Son, A. L.

Coal.
Big Creek Colliery Co.
Cleveland-Belmont Coal Co.
Old Ben Coal Co.
Rutledge & Taylor Coal Co.

Coloring.
Clinton Metallic Paint Co.
Robinson & Co.
Williams & Co., C. K.

Conveying Machinery.
(See Elevators and Conveyors.)

Counters.
Ceramic Supply & Cons. Co.

Crushers and Pulverizers.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machy. Co.
Fate Co., J. D.
Freese & Co., E. M.
K-B Pulverizer Co.
Manufacturers Equipment Co.
Sturtevant Mill Co.
Wallace Mfg. Co.

Cutters, Automatic Rotary.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machy. Co.
Crawford & McCrimmon.
Fate Co., J. D.
Freese & Co., E. M.
Manufacturers Equipment Co.
Marion Machine, Fdry. & Supply Co.
Steele & Sons, J. C.
Wallace Mfg. Co.

Cutting Wires.
Ceramic Supply & Cons. Co.
Manufacturers Equipment Co.
Webb Wire Works.

Dies.
American Clay Machy. Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Fate, J. D., Co.
Freese & Co., E. M.
Louisville Machine Co.
Manufacturers Equipment Co.
Nuttall Co., R. D.
Weller Mfg. Co.

Disintegrators.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Macby. Co.
Fate Co., J. D.
Freese & Co., E. M.
Manufacturers Equip. Co.
Marion M., Fdry. & Sup. Co.

Door Carrier (Dry Kiln).
Dry Kiln Door Carrier Co

Drills.
Sanderson-Cyclone Drill Co.

Dryers.
American Clay Machy. Co.
American Process Co.
Bartlett & Snow Co., C. O.
Bonnot Co.
Boss Co., J. C.
Chambers Bros. Co.
Fate, J. D., Co.
Jackson & Church Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Smith Co., Claude.
Philadelphia Textile Machy.
Standard Dry Kiln Co.
Steele & Sons, J. C.
Trautwein Dryer & Eng. Co.

Dryers (Sand).
American Clay Machy. Co.
American Process Company.
Bonnot Company.
Ceramic Supply & Cons. Co.
Fate Co., J. D.
Jackson & Church Co.
Schaffer Eng. & Equip. Co.

Dry Pans.
American Clay Machy. Co.
Bonnot Co.
Chambers Bros. Co
Chicago Brick Machy. Co.
Eagle Iron Works.
Fate Co., J. D.
Freese & Co., E. M.
Jackson & Church Co.
Manufacturers Equipment Co.
Toronto Fdry. & Mach. Co.

Dry Press Brick Machines.
American Clay Machy. Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chicago Brick Machy. Co.
Illinois Supply & Cons. Co.

Dynamos and Generators.
General Electric Co.
Lincoln Electric Co.
Westinghouse El. & Mfg. Co.

Electrical Industrial Trucks.
Elwell-Parker Electric Co.
Orenstein-Arthur Koppel Co.

Elevators and Conveyors.
American Clay Machy. Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Fate, J. D., Co.
Freese & Co., E. M.
Gandy Belting Co.
Link-Belt Co.
Louisville Machine Co.
Main Belting Co.
Manufacturers Equipment Co.
Mathews Gravity Carrier Co.
Toronto Fdry. & Mach. Co.
Weller Mfg. Co.

Engines and Boilers.
American Clay Machy. Co.
Bonnot Co.
Bruce-Macbeth Engine Co.
Freese & Co., E. M.
Jackson & Church Co.
Manufacturers Equipment Co.
Murray Iron Wks. Co.

Excavators.
Lechtenberg Bros.
Sauerman Bros.
Schofield-Burkett Cons. Co.

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Barber Asphalt Paving Co.
Barrett Mfg. Co.

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Du Pont Powder Co.

Fans.
American Blower Co.
American Clay Machy. Co.
Bonnot Co.
Freese & Co., E. M.
Manufacturers Equipment Co.
Murray Iron Works Co.
Trautwein Dryer & Eng. Co.

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Canton Grate Co.
Freese & Co., E. M.
Jackson & Church Co.
Murray Iron Wks. Co.

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Barrett Mfg. Co.
Lehigh Portland Cement Co.

Filter Presses.
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Baird Machine & Mfg. Co.
Bonnot Co.

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Baird Machine & Mfg. Co.

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Marion Mach. Fy. & Sup. Co.

Frogs and Switches.
Buckeye Rolling Mill Co.
Cincinnati Frog & Switch Co.
Orenstein-Arthur Koppel Co.
Toronto Fdry. & Machine Co.

Gas Engines.
Bruce-Macbeth Engine Co.

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General Electric Co.
Link-Belt Co.
Nuttall Co., R. D.
Toronto Fdry. & Machine Co.

Granulators.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Steele & Sons, J. C.
Wallace Mfg. Co.

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Armstrong Mfg. Co.
Brewer & Co., H.
Canton Grate Co.
Chambers Bros. Co.
Chicago Brick Machy. Co.
Cyclone Grate-Bar Co.
Fate Co., J. D.
Gerlock, H. W.
Jackson & Church Co.
Manufacturers Equipment Co.
Marion Mach., Fdry. & S. Co.
Murray Iron Wks. Co.
Smith Co., Claude.
Toronto Fdry. & Mach. Co.

Gravity Carriers.
Mathews Gravity Carrier Co.

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Stock Xylite Grease & Oil Co.

Hand Power Presses.
Fate Co., J. D.

Hoists.
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Bonnot Co.
Chambers Bros. Co.
Fate Co., J. D.
Link-Belt Co.
Manufacturers Equipment Co.
Weller Mfg. Co.

Hollow Brick Machinery.
American Clay Machy. Co.
Bonnot Co.
Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Manufacturers Equipment Co.

Hygrometers or Moisture Indicators.
Taylor Instrum't Companies.

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Bonnot Co.
Boss Co., J. C.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
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Fate Co., J. D.
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Ohio Kiln Co.
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Caldwell Co., W. E.
Fate Co., J. D.
Gerlock, H. W.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Smith Co., Claude.
Tecktonious Mfg. Co., E. C.

Locomotives (Electric).
General Electric Co.
Goodman Mfg. Co.

Locomotives (Gasoline).
Baldwin Locomotive Works.
Fate Co., J. D.

Locomotives (Steam).
Dewey Bros., Inc.

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Roessler & Hasslacher Chemical Co.

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Bonnot Co.
Gerlock, H. W.
Hensley, J. W.
Manufacturers Equipment Co.

Mold Sanders.
American Clay Machy. Co.
Bonnot Co.
Manufacturers Equipment Co.

Motors—Electric.
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Westinghouse El. & Mfg. Co.

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Federal Motor Truck Co.
Kelly-Springfield Motor Truck
Kissel Motor Car Co.

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Chicago Brick Machy. Co.
Illinois Supply & Cons. Co.
Weller Mfg. Co.

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Williams & Co., C. K.

Pans, Dry Pans, Wet Pans, Clay or Chaser Mills Combination Tempering Pans.
American Clay Machy. Co.
Bonnot Co.
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Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Jackson & Church.
Manufacturers Equipment Co.

Pallets and Trays.
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Ohio Galvanizing & Mfg. Co.

Patents.
Peck, Hubert E.

Perforated Sheet Metal.
Brewer & Co., H.
Ceramic Supply & Cons. Co.
Hendrick Mfg. Co.

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Schaffer Eng. & Equip. Co.

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Cincinnati Frog & Switch Co.
Lakewood Eng. Co.
Manufacturers Equipment Co.
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Standard Dry Kiln Co.

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Toronto Fdry. & Mach. Co.

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Du Pont Powder Co.

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Bonnot Co.
Jackson & Church Co.
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Weller Mfg. Co.

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Link-Belt Co.
Morse Chain Co.

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Bruce-Macbeth Engine Co.

Proportioner.
Schaffer Eng. & Equip. Co.

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Chambers Bros. Co.
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Fate Co., J. D.
Freese & Co., E. M.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Schultz & Son, A. L.
Steele & Sons, J. C.
Wallace Mfg. Co.

Pulverizers.
(See Crushers.)

Pyrometers.
Beighlee Instrument Co.
Bristol Co.
Brown Instrument Co.
Ceramic Supply & Cons. Co.
Engelhard, Chas.
Price Electric Co.
Sander Instrument Co.
Stupakoff Laboratories.
Taylor Instrum't Companies.
Thwing Instrument Co.
Trautwein Dryer & Eng. Co.

Rails (Frogs and Switches).
Buckeye Rolling Mill Co.
Ceramic Supply & Cons. Co.
Chase Fdry. & Mfg. Co.
Cincinnati Frog & Switch Co.
Lakewood Engineering Co.
Orenstein-Arthur Koppel Co.
Toronto Fdry. & Mach. Co.

Rattler.
American Clay Machy. Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Freese & Co., E. M.
Manufacturers Equipment Co.

Recording Gages.
Brown Instrument Co.
Ceramic Supply & Cons. Co.
Price Electric Co.
Sander Instrument Co.
Taylor Instrum't Companies.

Represses.
American Clay Machy. Co.
Bonnot Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Chicago Brick Machy. Co.
Freese & Co., E. M.
Lakewood Engineering Co.
Steele & Sons, J. C.

Rope Preservative.
Cling-Surface Co.

Roofing Tile Machinery.
American Clay Machy. Co.
Bonnot Co.
Fate Co., J. D.
Freese & Co., E. M.

Rope (Wire and Manila).
Broderick & Bascom Rope Co.
Leschen & Sons Rope Co.
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Sand Dryers.
American Clay Machy. Co.
American Process Co.
Bonnot Co.
Fate Co., J. D.
Jackson & Church Co.
Schaffer Eng. & Equip. Co.

Sand Lime Brick Machinery.
American Clay Machy. Co.
Ceramic Supply & Cons. Co.
Chicago Brick Machy. Co.
Illinois Supply & Cons. Co.
Jackson & Church Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.

Scrapers, Plows and Clay Gatherers.
Eagle Iron Wks. Co.
Lechtenberg Bros.
Sauerman Bros.
Schofield-Burkett Cons. Co.

Screens (Clay and Cement).
American Clay Machy. Co.
Bonnot Co.
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Chase Fdry. & Mfg. Co.
Ceramic Supply & Cons. Co.
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Fate Co., J. D.
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Hendrick Mfg. Co.
Lakewood Engineering Co.
Link-Belt Co.
Louisville Machine Co.
Schofield-Burkett Cons. Co.
Sturtevant Mill Co.
Weller Mfg. Co.

Sewer Pipe Machinery.
American Clay Machy. Co.
Bonnot Co.
Brewer & Co., H.
Manufacturers Equipment Co.

Shovels (Power).
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Link-Belt Co.
Marion Steam Shovel Co.
Thew Automatic Shovel Co.
Osgood Co.

Silent Chain Drives.
Link-Belt Co.
Morse Chain Co.

Silo Block Cutter.
Crawford & McCrimmon Co.

Soft Mud Brick Machines.
American Clay Machy. Co.
Bartlett & Snow Co., C. O.
Bonnot Co.
Chambers Bros. Co.
Eastern Machy. Co.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Wallace Mfg. Co.

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American Clay Machy. Co.
Schaffer Eng. & Equip. Co.

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Canton Grate Co.

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Chambers Bros. Co.
Fate Co., J. D.
Freese & Co., E. M.
Steele & Sons, J. C.
Wallace Mfg. Co.

Steel Pallets.
Lakewood Eng. Co.
Ohio Galvanizing & Mfg. Co.

Steel Towers.
Caldwell Co., W. E.

Supplies.
American Clay Machy. Co.
Bonnot Co.
Brazil Machine & Fdy. Co.
Ceramic Supply & Cons. Co.
Chambers Bros. Co.
Freese & Co., E. M.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Steele & Sons, J. C.
Wallace Mfg. Co.
Weller Mfg. Co.

Tanks.
Caldwell Co., W. E.

Thermometers.
Beighlee Electric Co.
Bristol Co.
Brown Instrument Co.
Ceramic Supply & Cons. Co.
Engelhard, Chas.
Price Electric Co.
Manufacturers Equipment Co.
Standard Dry Kiln Co.
Taylor Instrum't Companies.
Thwing Instrument Co.

Tile Machinery.
American Clay Machy. Co.
Bonnot Co.
Brazil Machine & Fdry. Co.
Brewer & Co., H.
Chambers Bros. Co.
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Leschen & Sons Rope Co.
Manufacturers Equipment Co.

Are You Meeting Competition at a Loss?

Every manufacturer strives to meet competition and at the same time retain the largest percentage of profit for himself.

If there is any waste—any leak in some part of the business—the largest profit is not obtained, and competition is harder to meet.

In a great many brick kilns there is a prodigal waste of heat going on that can be harnessed to render a remarkable economy—giving the owner a much larger percentage of the profits.

If the enormous amount of heat which is stored even in the ordinary kiln is permitted to go into the surrounding air, with it goes a great amount of money. Money is paid for this heat. Why is it not always used?

You can put an end to this waste if it is going on in your plant.

Are you interested in knowing just how? Certainly you are.

Every business man is interested in profits.

A system has been perfected that will convert the waste heat of a brick kiln into real dollars.

All the problems of brick drying are met by the use of a "Sirocco" Waste Heat System, in a simple, automatic, and correct manner.

Consider what it will mean to the profits of a brick business to utilize the same heat that burns the brick to the purpose of drying other brick. And time is saved as well. With the "Sirocco" Waste Heat Drying System there is no water smoking—this will save four-fifths of the time consumed by the old method.

The "Sirocco" Waste Heat Drying System is ideal. By its application a three-fold economy can be effected.

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After the fires are out, a kiln holding 200,000 brick will throw off more heat than a 100-horsepower boiler would require for two weeks' operation.

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In the third place, the proportion of broken brick is reduced to a minimum. You save time, heat and brick.

The remarkable saving—actual earning, that will result from the use of the "Sirocco" Waste Heat Drying System is vital to the success of the brick manufacturer.

The perfection of this system is the result of over twenty years' study and experience by the American Blower Company in the problems of drying clay products.

You are not making all of the profits out of the brick business that you ought to, and you are less able to meet competition if you are buying heat and not using it.

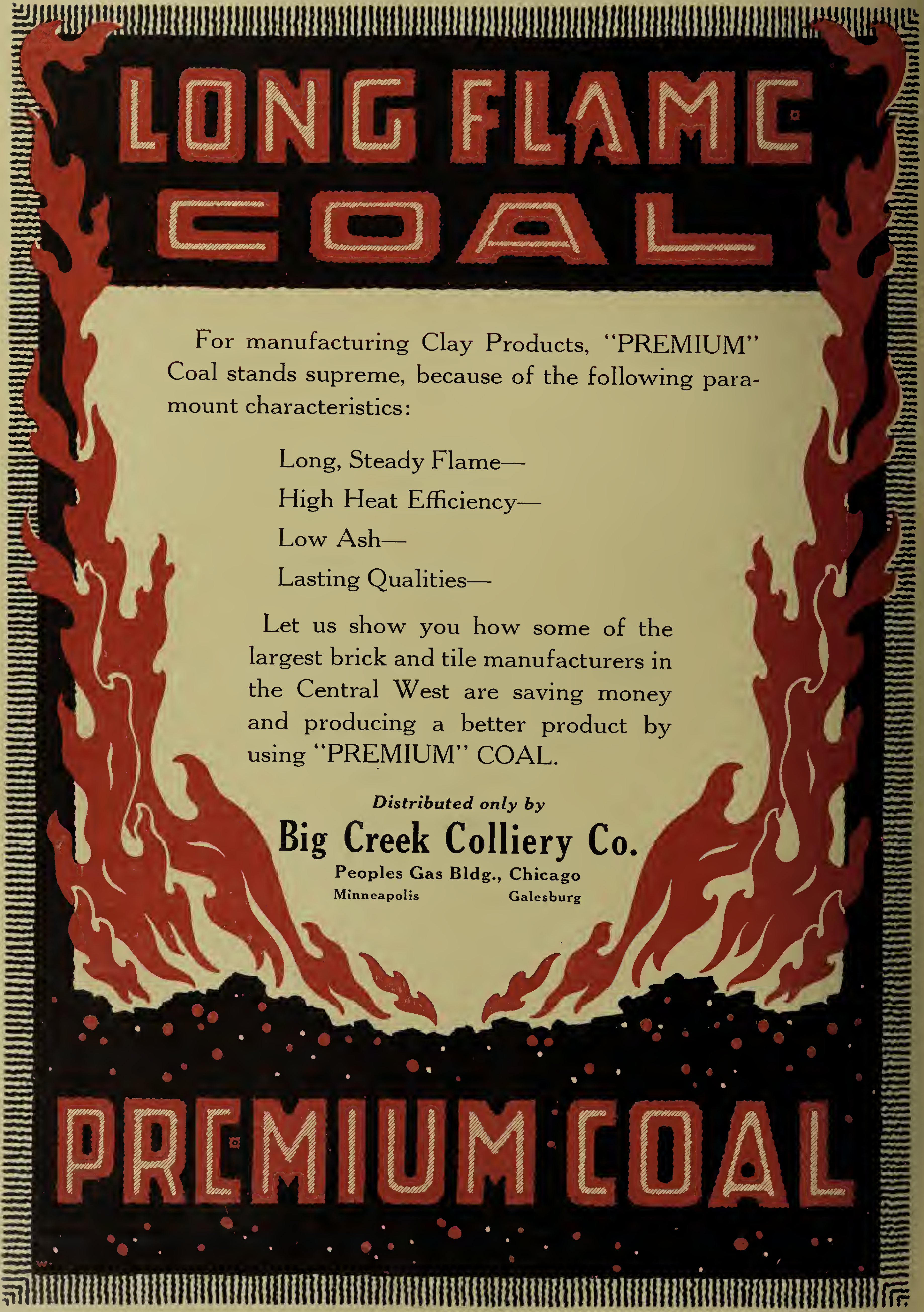
AMERICAN SIROCCO BLOWER COMPANY

AMERICAN BLOWER COMPANY

DETROIT, MICHIGAN, U.S.A.

CANADIAN SIROCCO COMPANY, LIMITED, Windsor, Ontario, Manufacturers for Canada

SAY I SAW IT IN BRICK AND CLAY RECORD



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Low Ash—
Lasting Qualities—

Let us show you how some of the largest brick and tile manufacturers in the Central West are saving money and producing a better product by using "PREMIUM" COAL.

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PREMIUM COAL

BRICK and CLAY RECORD

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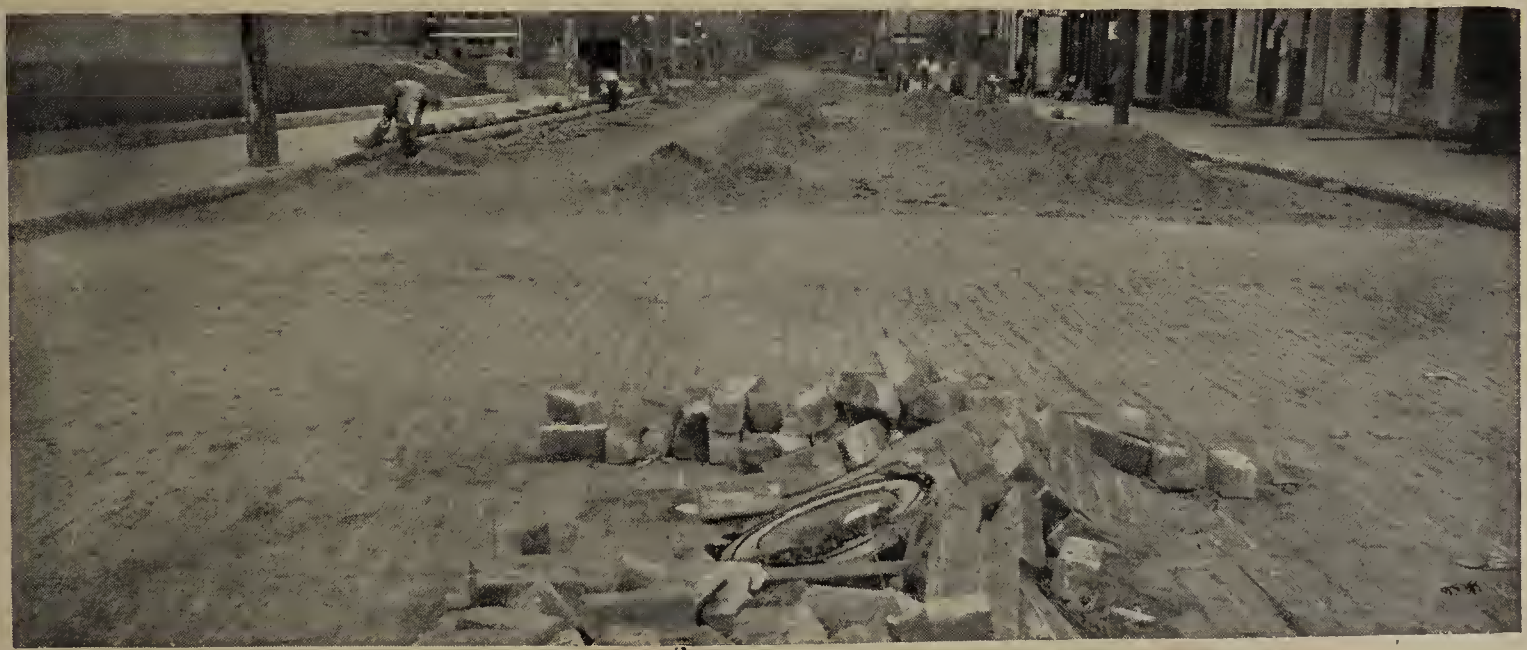

Court House Square, Rushville, Indiana

Vol. XLVIII, No. 11 Chicago June 6, 1916

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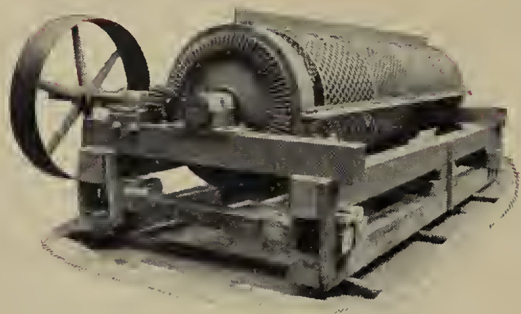

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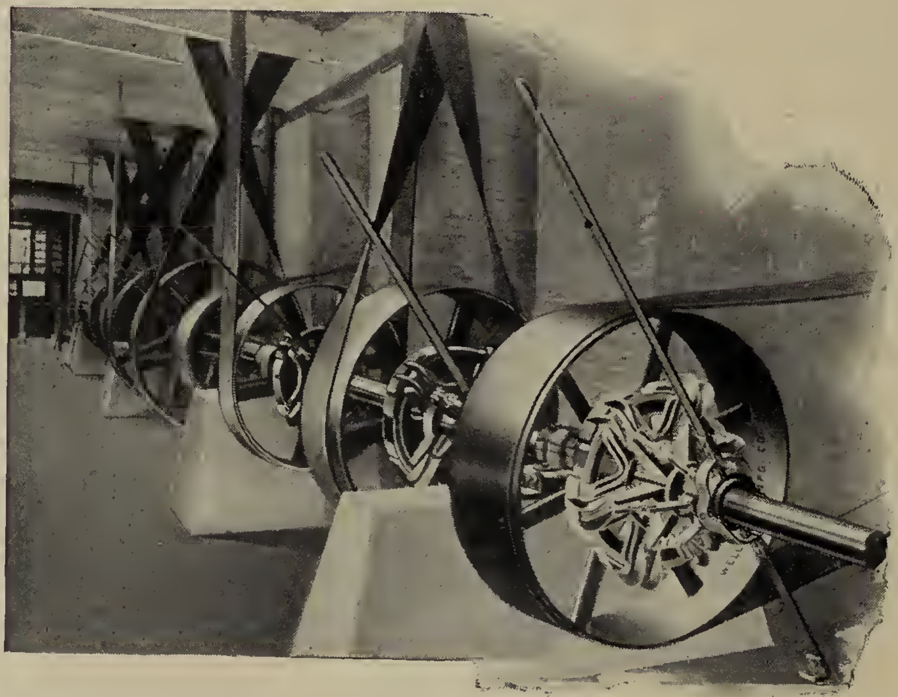

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SAY "I SAW IT IN" BRICK AND CLAY RECORD

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Entered as Second Class Matter January 2, 1911, at the Post Office, at Chicago, Ill., Under the Act of March 3, 1879.

Terms of Subscription
One Year—(24 Numbers)
United States......$2.00 Foreign $3.00
Single Copies.......25c

Published the first and third Tuesdays of each month by

Kenfield-Leach Company
445 Plymouth Court Chicago

Chicago, June 6, 1916
Vol. XLVIII No. 11

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The EDITOR'S CORNER

Comment, Criticism and Advice on Live Issues Affecting the Manufacture, Marketing and Manifold Uses of Burned Clay Products

OF more than passing interest are the two recent meetings of the Supply Dealers Board of the Society Advocating Fire Elimination at which the subject of cost accounting was thoroly discussed. Those who attended these gatherings say that they would not have missed them for the price of a year's dues in the Board.

With figures prepared by Earl Ross of the Cuyahoga Builders' Supply Company, as a basis, eleven other members submitted cost percentages as applied to eight commodities previous to January 1, 1916. These figures were tabulated to arrive at averages that may safely be considered as representative of conditions in Cleveland, of "small" and "big" dealers.

It was found that it cost the dealers 5.22 per cent. to handle brick, 8.14 per cent. for hollow-tile and .97 per cent. for sewer-pipe; thus, if a certain face-brick, for instance, cost the dealer twenty dollars, it would be necessary for him to obtain $21.05 for the same brick in order to at least break even.

These meetings are certainly a step in the right direction. No doubt some of those present opened their eyes when they saw how cost was being figured by the "other fellow" and left with a secret resolve to make certain changes in their methods of keeping track of cost.

Unless the dealer knows, absolutely, what it is costing him to handle his business, he does not know whether he is actually making or losing money.

The business of handling building materials, which includes all clay products, has been in particular need of some one to strike an awakening note regarding the antiquated methods of cost accounting that have prevailed among many of the dealers. There are some items in connection with the expense of handling brick, for instance, that are so apt to be pushed aside as having no part in the general cost system. These need investigating, and it is only by meeting together and frankly discussing the problem of cost as it now presents itself, that any real progress can be made in the direction of informing a dealer regarding his cost.

It is absolute folly for a man to go on fooling himself regarding this very important part of his business, especially in view of the recent efforts of both dealers and manufacturers to get together, each in his own class, and discuss cost, also the knowledge now being disseminated.

Open Price in New York

IT takes considerable courage to be a pioneer. We can remember reading in childhood days of the brave men and women who, forgetful of their own physical comforts and unmindful of the dangers that lay before them in an unknown wilderness, went forth to conquer the savage inhabitants and to settle that part of Colonial America that could be seen from the summits of the Appalachians. They were heroes in buckskin and homespun.

Altho it seems rather strange to talk of pioneers in this twentieth century, when the unexplored corners of the globe are fast disappearing and when industry and trade are swiftly mounting to the dizzy heights of efficiency, yet every once in a while we hear of someone who has blazed a new path for the onward march of industrial progress.

But there are still some dark woods in the clayworking industry that are badly in need of the light of intelligence and modern business methods. In these figurative forests there is much of the "secret price," capriciously raised and lowered, with secret rebates and "rake-offs" to favored customers who would be served and whose business, it seems, demands unusual sacrifices to retain.

A face-brick manufacturer, who is a real pioneer and who is making an honest effort to break down the Chinese wall of secrecy and distrust that has too long hindered the development of the highly honorable business of selling brick, is Fiske and Company, Inc., of New York. This concern has set a splendid example to other manufacturers and dealers in face-brick, particularly, by its recent announcement of the adoption of the "Open Price Policy" in the sale of its face-brick in the territory included in Greater New York.

It took a great deal of faith, no doubt, and much courage for this concern to arrive at this decision, for which due credit is to be given. It is only hoped that more manufacturers will follow in the footsteps of this pioneer of face-brick manufacturers in a policy that will do much to set the business on a higher plane of salesmanship.

Americanization

HAS it ever occurred to you that the workmen on your plant are worthy of some attention other than the supervision that is exercised to see that they do their tasks promptly and well.

The majority of men employed on the average clay plant are foreign-born and, therefore, are handicapped by a lack of knowledge of the English language which is usually the vehicle upon which orders and instructions are carried to the men. A recent report made by the National Safety Council covering an industrial plant stated that eighty per cent. of the accidents in that plant occurred among the foreign-born workmen who constituted but thirty-four per cent. of the total number employed. Some use of the imagination can easily picture what the result would be if this ratio were reversed and sixty-four per cent. of the total number of employes were foreigners. It would mean that, if the same average in accidents were maintained, that just two men would be killed or injured for every one that was formerly disabled. Does not a condition such as this demand serious consideration? Happily, this company recently established English classes in the plant and claims that such instruction reduces the number of accidents.

This brings to mind the measures that various industries are taking to Americanize their workmen, thereby not only cutting down the number of accidents on the plant but producing more efficient employes.

Practical Helpfulness

THE most practical Americanization work in the country is being done today by organized industries. It proceeds along the lines of conserving men and stablizing the labor markets, and is being organized both inside and outside the plant. Many industries keep card records and make physical examinations of applicants and assign work adapted to the individual's physical condition and previous experience. Employment blanks frequently include questions relating to community relationships, citizenship and ability to speak, read and write the English language, and as the immigrant's first American contact is usually at the plant's employment office, his early interest in the community life and in American citizenship is thus stimulated by the desire to advance.

It is generally agreed that a workman's efficiency is increased thru rest, health and contentment, and happiness in his relationships outside the plant, and many industries in smaller industrial communities are promoting such efficiency by providing adequate and sanitary living quarters for workmen. What can be done is illustrated in one instance where the company's employes were formerly housed in old-fashioned, box-like, double-decker frame houses. Many boarders were kept and family life was not preserved. The company then built one hundred four room bungalows—with inside toilets and running water, back and front porches and a small truck garden—which it rented for $7.00 and $7.50 a month and encouraged home owning by selling them at practically cost price, paid for on the low monthly rental plan. The experiment was so successful that one hundred and fifty additional bungalows were immediately put up and two hundred more contracted for. The boarder evil has been practically eliminated, the labor turn-over has been reduced, and now workmen, attracted by higher wages in other places, frequently return because of the community and social facilities the company has provided.

"Americans First"

THE teaching of the English language, as has already been mentioned, and promoting American citizenship have also been found important factors in conserving men and stablizing employment. This has been stimulated in several plants by the adoption of an "Americans First" policy which provides for preference in promotion to native-born or naturalized citizens, or to those of foreign birth who are diligently preparing themselves for citizenship. One company offered a wage increase of two cents an hour to all workmen attending classes in English and citizenship in the evening schools. Others have established classes in English in the plant, non-English-speaking workmen being required to attend during working hours on company's time.

Industries which have undertaken such practical Americanization work have passed from the welfare stage of this work into the new spirit which is abroad in business. It is now considered as part of the cost of production and, from an efficiency standpoint, as promoting industry and an increase of total wealth to the community of which each is a member. It is no longer being done to "help" the workman, and the middleman or "straw-boss" is being gradually eliminated.

A Paying Investment

ALTHO it is hardly probable that all of the suggestions contained in the Americanization work done in other industries are applicable to the business of turning raw clay into finished building materials and other products, still, considering the industry as a whole, most of them could be used to advantage, thereby securing a more intelligent handling of the labor problem. Just now, when it is hard to get any kind of workmen, and particularly skilled hands, even at increased wages, manufacturers are casting about to learn how they can make the material which they have in hand more efficient and more willing to stay in their employ.

This being the case, it might be well for manufacturers of clay products to investigate what other industries are doing in the way of Americanizing their employes. The following out of these ideas will pay, not only now when labor is scarce and much of it "green," but later, when there are plenty of workmen and when a premium can be placed upon the ability of a man to speak the English language and to live like a true American citizen.

The Busiest Street in Hopewell. Here Little Groups Gather to Discuss the News of the Day and to Spend Their High Wages

The REGENERATION

Rising Out of the Smoking Ruins of a Burned
—Has Reared Its Head, Containing Hardly a

BUILT in five months, burned in five hours and rebuilt in five weeks—this is a thumb nail history of Hopewell, Va., the "Wizard City," or perhaps better known as "Powdertown." Just how true to exact facts is this laconic statement, does not interest us much here, rather does it convey in truly American style, the speed with which events have overtaken this magic city of the cornfields.

Regarding the building of Hopewell, which really embraces two other separate communities—City Point and DuPont City—much has already been written. At least two popular magazines of wide circulation have carried feature stories covering this phenomena of the European War in America. This, together with the publicity which a certain builder of portable wooden homes has given it, has made the name of Hopewell familiar in nearly every household.

On the morning of December 10, 1915, the whole country was startled by the report that Hopewell had burned —the victim of flimsy wooden construction thrown up in the feverish haste of the early part of the year when Hopewell began its mushroom growth. Nearly every one is familiar with the story of how the disastrous conflagration wiped out three-fourths of the town, including the best of the business district, and making ten thousand people homeless. So it is hardly necessary to dwell long upon this event which has since passed into history as a monument to the foolhardiness of the American builder.

But it is in the last epoch of this thumb nail history that we are most interested—namely, the rebuilding of "Powdertown."

It was during April that an unobtrusive item appeared in an eastern newspaper as follows:

"The plant of the Hopewell (Va.) Brick Company is now in the course of construction, much of the machinery already having been installed. It is expected that operations will begin sometime during the present month. The company was recently organized with a capital stock of $25,000, much of which has been purchased by local business men."

While this piece of news was seemingly of little interest to the casual reader, yet it contained a wealth of suggestion to the citizen interested in seeing a safer and saner-built America. It meant that Hopewell, having learned the lesson that a serious conflagration always brings, was preparing to rebuild that part of its charred business district that had not already heeded the call, with brick, and that the demand which was being created by this new wave of fire-safe construction was sufficient to warrant the establishment of a brick plant at that point.

A recent visit to "Powdertown" disclosed the fact that nearly every building of any importance in the all-but-annihilated business district has brick as its chief constituent. The burned district was formerly comprised of frame shacks, tin makeshifts and even tents, there being not more than five or six brick buildings in the en-

Another Important Thorofare That is Well-Lined with Brick Buildings, Most of Which Have Just Been Completed

of "POWDERTOWN"

Hopewell, a New City — Built with Brick Vestige of the Former Flimsy Construction

tire town. There are now about one hundred brick buildings and these are only the start of a comprehensive construction program that will use little else than the "best of all building materials."

Hopewell lies between Village "A" and Village "B," inhabited almost exclusively by those who are employed in the gun-cotton mills. "A" Village is at City Point where there are five hundred cottages, housing the mechanics and foremen—the aristocracy of "Powdertown." Here also are the residences of the higher salaried officials. "B" Village is composed of about two thousand cottages for the married employes and rent for a nominal sum—from $5.50 to $10, including telephone, light and janitor service. This is the first of the company settlements where snappy little houses are set with mathematical precision, just like so many flowers in a big flower bed. It might be mentioned in connection with this settlement that the low rental above mentioned is set with the understanding that at least one boarder will be taken in by a family, as the housing of its employes has been a problem for the mills.

A third settlement or "C" Village has been built to the east of the mills on a plateau overlooking the James River. Here the single men and those whose families have not as yet migrated, are provided sleeping room in bunkhouses, each structure accommodating several men. In addition to these housing provisions, City Point has a large hotel with rooms for single men.

It is hardly possible to secure an adequate conception of this polyglot community with its seething mass of humanity without making a visit to Hopewell. At one time there were as many as twenty-seven thousand men employed in the mills and their construction, which ran the payroll well over a million dollars a month. With a bi-monthly pay-day, five hundred thousand dollars hit the town like a cyclone every two weeks, turning the muddy, unpaved streets into veritable avenues of gold. While much of the spectacular is passing from the city, and less "rolls" are being shown—a certain number of the men are being paid off every day—still one may see at the foot of the birdge that spans the tracks of the Norfolk and Western from the mills to the business section of the town, three or four barkers, their fists bulging with green and yellow, and offering to cash the workmen's checks.

There are now about eighteen thousand men employed in the gun-cotton mills at this point, the lowest wage being about $2.80 per day, and ranging up to as high as twenty dollars, in a few instances. Ordinary mechanics receive forty-two cents an hour, the better paid construction men got sixty-five and seventy-five cents, but the average wage is not far from four dollars a day.

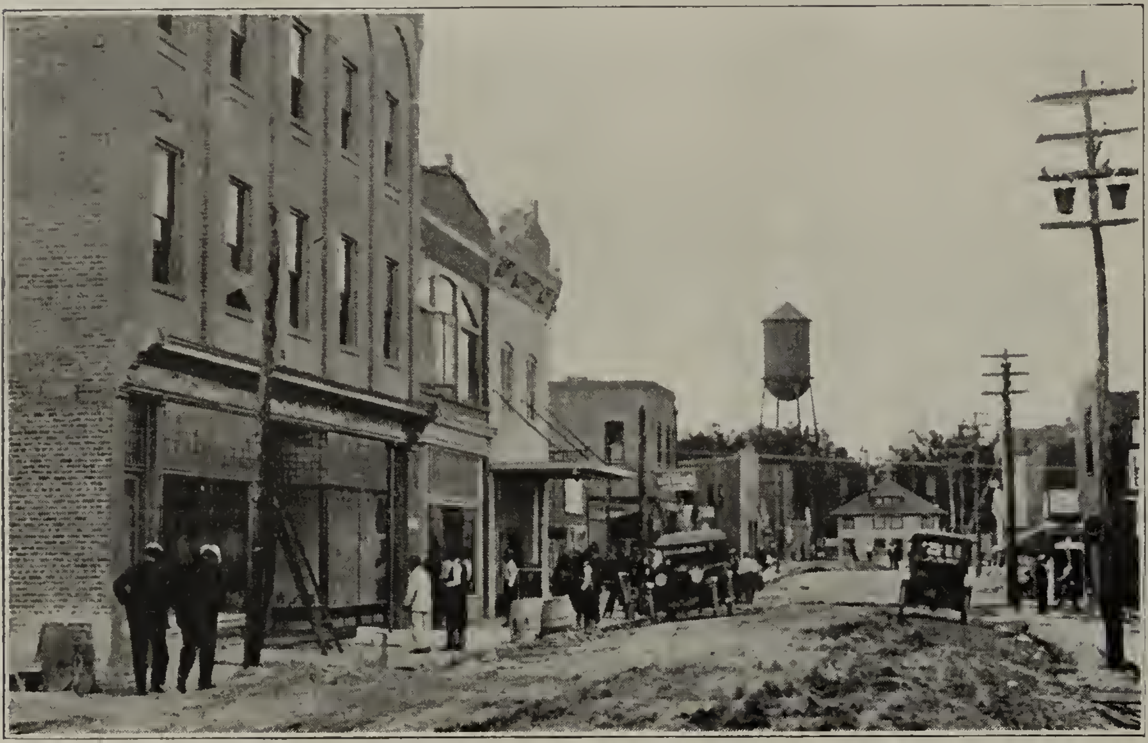
There is, however, a question which one hears on every hand from those who are not fully acquainted with the "Wizard City" and its prospects for the future. It is: How long will this last?

The best answer that can be given to the question is the following ad., which appeared recently in the local daily paper:

"There Is a Reason"
Why Hopewell Is Prosperous

Because:

To begin with, Hopewell's citizenship is made up of the most public-spirited, energetic and wide-awake lot of people ever brought together in one community. Everybody is a booster, and everybody is a worker. And with these two very important qualities embodied in the pioneers of Hopewell, there was nothing else to develop but prosperity.



Now That Is Has Got Started on a Safe and Sane Building Program, Hopewell Probably Needs Good Paving More Than Anything Else

Because:

There is nearly a million-dollars-a-month payroll circulating in the hands of this energetic citizenship, and this is reason enough to make the most pessimistic a firm believer in the continuance of Hopewell's prosperity.

Because:

It is now a certainty that Hopewell will have a two million dollar steel plant, which also gives proof that Hopewell's prosperity will not be just temporary, but permanent.

Because:

The merchants of Hopewell have erected fireproof, brick buildings and are carrying larger stocks of seasonable merchandise and are rendering store service that is appreciated by the public, which, in response, is keeping more of that million-dollar-a-month payroll at Hopewell recently than ever before.

Because:

Men who inhabit the "Wonder City" today are men who have moved their families here and are going to camp right on the grounds where they work. No more fat checks and money order are going thru the mails as of old. "The Money Made in Hopewell Today is Money Spent in Hopewell Tomorrow."

Because:

Hopewell is not just stopping at one or two primary industries, but is going after and getting large, small and "middlein" size industries, which will mean a variety of industries that every city of any importance goes after, but does not always get. Variety of industry means prosperity, stability and employment for all classes.

Because:

"It's the Great Big Infant City with a Future."

BY A COMMITTEE.

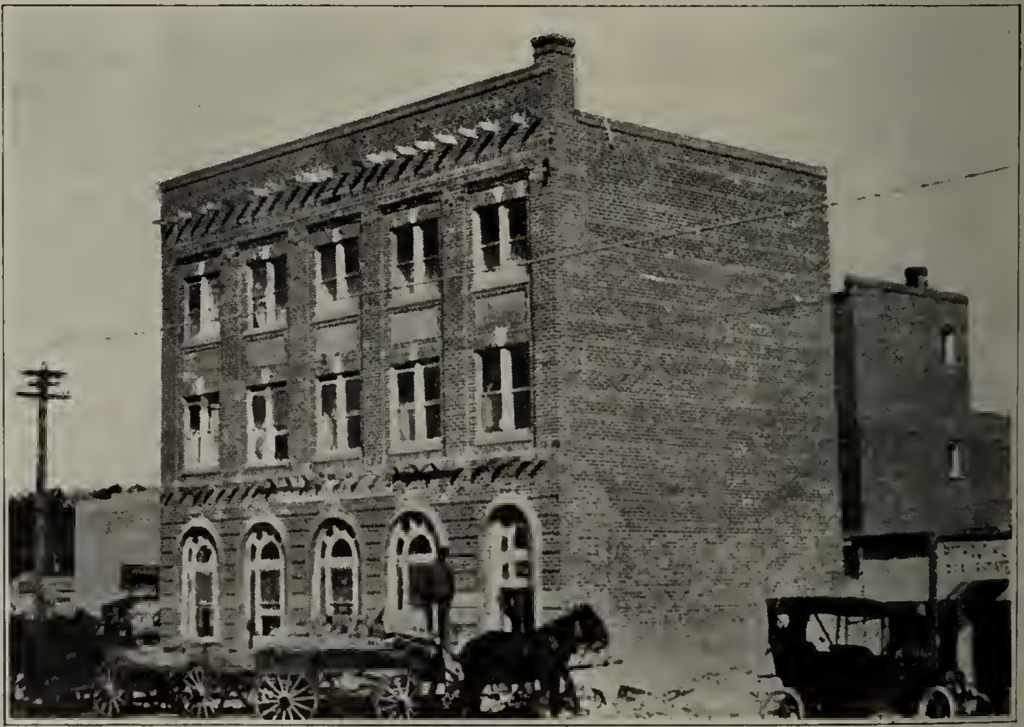
It will be noted that particular emphasis is placed upon the fact that Hopewell is being rebuilt with brick, by those who are most interested in its advancement. Brick has been used as the symbol of permanence and stability and as the constituent of a good foundation upon which the greater Hopewell of the future will be built.

The accompanying illustrations are good evidence of the proportion of brick structures that are now to be seen in the business district of the "Wizard City" where eight months ago nothing but a conglomeration of wooden shacks lined the streets. The city is gradually assuming more orderly proportions, thanks to the civic pride of some of its citizens.

In all of the buildings that rose out of the ruins of the fire last December, and which have been erected during the early part of the year, brick from points outside of Hopewell have been used, most of it coming from Richmond and Norfolk, Va. However, as has already been mentioned, a new brick plant has been built and put into operation, being located on the outskirts of the town and near the James River.

One sees for the most part a red, soft-mud, common-brick in Hopewell, but here and there are buildings faced with a good quality of face-brick, and there is at least one job of enamel brick—a moving picture theatre. Hollow-tile is also in evidence at many points.

There is one noticeable lack in Hopewell—a lack that is known to some of its prominent citizens. It is that of good paving. Strange as it may seem at this time, there is not a single paved street in this already large city of



One of the More Pretentious Brick Structures in "Powdertown" That Is Nearing Completion nearly forty thousand inhabitants. Great ruts mark every thorofare, with ankle deep mud, making it disagreeable to cross at any point but an intersecting street; while blinding clouds of dust are whirled up the avenues by the winds of warmer days.

Hopewell is far from being a Utopia as yet. It has many needs, both of government and of material improvements. One of the most urgent of these is good paving, and those who are to be placed in control of the city's affairs can do nothing better than to follow out the policy of permanent building which has already been instituted, and pave with brick.

Fiske Company, Inc., Announces "Open Price Policy" for Greater New York

Following the successful application of the "Open Price Policy" to the sale of "Fisklock" brick, Fiske & Company, Inc., have announced that beginning May 1st, all face-brick sold by its organization in Greater New York will be marketed under the policy of one price to all.

In a circular letter addressed to manufacturers, competitors and friends in the face-brick business, the company says:

"No one familiar with the facts will deny that the face-brick business in New York City is in a most deplorable condition, with no particular relief in sight.

"The cost of manufacturing, as well as the cost of distribution, is steadily increasing while prices are either stationary or declining.

"We believe that the face-brick business needs to be standardized so that all manufacturers and dealers will adopt a more uniform method of doing business and a more uniform as well as a higher price.

"At present each dealer has a different way of doing business, and his prices are made without any intelligent knowledge of those of his competitor. In nearly every instance he has no fixed price but 'gets what he can.'

"As a result of this confusion and lack of system, the purchaser in many cases fixes the price and the dealer is subject to all kinds of abuse at the hands of unscrupulous purchasers.

"We believe that a system of standard price lists would do much to remedy this condition.

"To make such a plan successful, however, each dealer would have to publish a price list and adhere to it strictly. If this plan were followed faithfully in New York City for six months it would elevate the face-brick business to the plane of other retail businesses which command the respect of the public.

"Such a plan would inevitably result, not only in a far greater ease of doing business with less attendant expense, but would secure a reasonable margin of profit to both the manufacturer and the dealer.

"Such a plan would be entirely within the law and would attain the results which are so much desired by all parties in the business.

"Despairing of securing any co-operative effort along this line, however, we have decided to adopt this system individually, as an evidence of which we take pleasure in handing you herewith our Price List No. 1 effective May 1st, 1916.

"We respectfully call your attention to our declarations on page 3, particularly the marked paragraph. We trust you will realize that having made such an emphatic statement to the trade we will be compelled to adhere to this price list until we get ready to publish a new one.

"So far as Fiske & Company, Inc., is concerned 'price cutting' is absolutely at an end.

"We trust you will be interested in this announcement on our part and in our adoption of the 'Open Price System,' and we hope it may lead to the adoption of the same system by other dealers.

"If it is so adopted we predict a revolution in the retail sale of face-brick in this city."

Accompanying this letter a standard price list for face-brick was mailed which makes it plain that the prices listed therein do not apply outside of greater New York where the company does not make delivery at the building and where New York freight rates do not prevail.

In the circular which includes the price list, the company states: "We realize that we are the first to adopt the open-price system for the retail sale of face-brick at least in this city, but we confidently expect to receive the approval and support of the architectural profession and the contracting world because this system is the only one which insures a square deal to all."

Hopewell Has at Least Two Safe Banks. Both of Them Are Built With Brick

"Show Me" Commissioners Favor Brick Paving

Brick was the favored paving material in the recent report of three Joplin, Mo., commissioners, who were authorized to make an investigation prior to the decision of city authorities regarding the kind of paving to be used in some new work which that municipality is now contemplating.

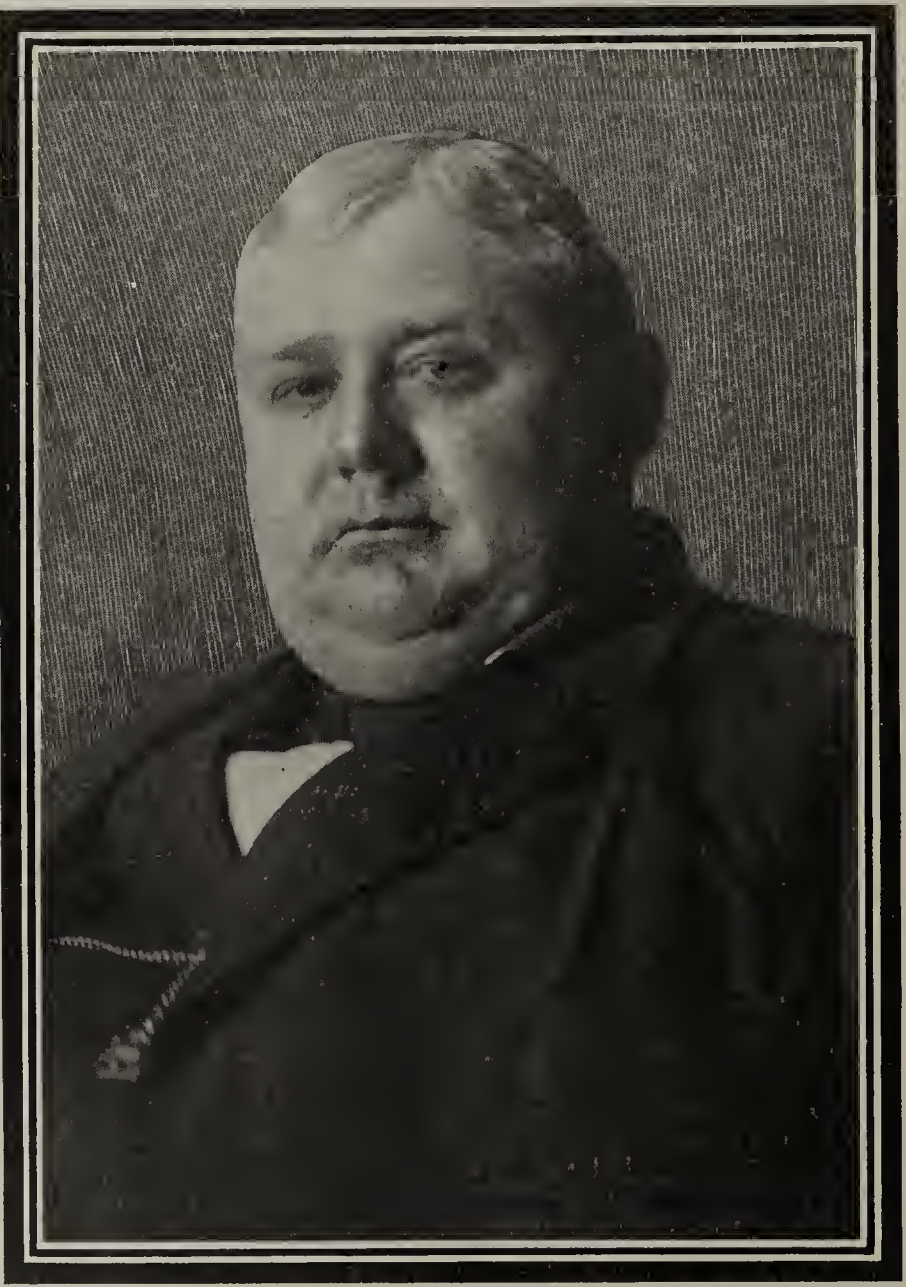
Charles A. Robinson, Commissioner of Revenue, J. B. Hogdon, Commissioner of Streets and Dr. B. R. Tyler, Commissioner of Health, made an inspection tour thru four cities of Kansas and Missouri, the commissioners being unanimous in their verdict that vitrified paving-brick was the most durable and economical material, and making a pavement that will withstand the heaviest traffic.

Born February 19, 1873

Harley H. Fate

Died May 29, 1916

HARLEY HIRAM FATE, president of the J. D. Fate Company, Plymouth, Ohio, died suddenly of heart failure at the Huron Road Hospital, Cleveland, Ohio, Saturday, May 27, 1916. Mr. Fate was operated on for a simple ailment on May [illegible]9th and was recovering so rapidly that he was soon to be removed to his home. Friends who had called on him the day before his death found him in that happy and jovial frame of mind that had endeared him so much to those who knew him. The shock of his sudden death was, therefore, the greater to his family and numberless friends.



The funeral was held at the family home in Plymouth, Ohio, on Memorial Day, the services being conducted by the Knight Templars, who had assembled from Mansfield and surrounding towns. Prayers and words of consolation were also offered by Rev. Dr. A. C. Miller of Mansfield, Ohio, an old-time friend of the Fate family, and Rev. G. C. Smith of Plymouth, pastor of the Lutheran church.

Solemn and simple, the funeral was the largest ever held in Plymouth, thus attesting to the wide popularity of Harley Fate. One of the most touching incidents in this connection was the grief displayed on the tear-dimmed faces of the men from the Fate shops as they filed past the casket to pay their last respects to one who had been more than an employer to them. He had been their friend and counsellor and he knew every one of them and their families intimately. His men never hesitated to go to Harley Fate when in difficulty or distress. They were always sure of an understanding reception and of help where assistance was merited. He was genuinely democratic, but yet had the highest respects from all.

No man was better known in the clayworking industry than Harley Fate. Ever since he was a boy in short trousers he attended the N. B. M. A. conventions, at first accompanied by his father, J. D. Fate, the founder of the business that bears his name. On the death of Harley's father, in 1902, he was made president of the J. D. Fate Company, and has been actively engaged in the manufacture of brick and hollow-ware machinery and the Plymouth locomotive since that time. It is entirely superfluous to dwell upon the part which Harley Fate has played in the advancement of the industry in recent years. His product and his policies are too well known to call for elaboration at this time.

He was a tireless worker himself, yet he was an ideal executive in that he surrounded himself with capable co-workers in whom he always had implicit faith and confidence. The organization for which he was so largely responsible is a cohesive one, thoroly efficient, and it is a compliment to Harley Fate's far-sightedness that his associates will find no difficulty in continuing the business along the lines followed for several years past. There will be little confusion in resuming the onward march of the organization when its members have accustomed themselves to the loss of their leader. Each has been trained in the management of the business and, so closely knit is each integral part of the organization, that, altho its director is absent, it will continue the good work along the channels long since laid out.

Those who have been most intimately associated with the development of the business are his brother, Harry S. Fate, vice-president; George B. Drennan, secretary-treasurer; H. Ray Sykes, director of sales and H. J. Votaw.

Mr. Fate was married in 1903 to Anna B. Lawton of Three Rivers, Mich., and two daughters were born to them, Mary Josephine, now ten, and Gertrude Emaline, now six. They have lost a loving, kind and indulgent husband and father, but with the mother, sister and brother who also survive him, they have memories of Harley Fate which must be consoling because of their tenderness.

Our sympathies can but help them to bear their cross with greater fortitude and strengthen them in their time of sorrow.

> "Farewell, thou faithful servant, rest in peace;
> Tho mortals toil and triumph, build and plan,
> Yet all must go, the master and the man,
> Into the valley of the Soul's release."

THE DESIGN *and* CONSTRUCTION *of* CONTINUOUS KILNS

Some Clarifying Notes on a Much Misunderstood Piece of Clay Plant Equipment Which Had Its Origin in Europe

By A. F. Greaves-Walker

Author of "The Design and Construction of Down Draft Kilns," "Setting Down Draft Kilns," "Running a Plant to Capacity" and "Dies for Hollow Ware."

(*Continued from May* 16 *issue.*)

WHEN wooden roofs are built, great care should be taken to have the trusses high enough above the top of the kiln to avoid the danger of fire. Care must also be taken to avoid placing trusses or other timber work near the vents in the crown or crowns or near other parts of the kiln which become very hot. The exposed gas flues on a gas fired kiln are one of the points that must be watched in this respect as they get very hot during "burnouts."

When constructing a producer-gas-fired kiln it is necessary to provide a building for the housing of the gas producers, and it will be well to bear in mind the fact that this is one of the important parts of the plant. Up to very recently it was the custom to merely cover the producers with a wooden roof, the duty of which was to protect the operators from the weather. In the past few years, however, the efficient manufacture of the gas has been given considerable thought and study by a few of those interested in the subject, and the result has been the evolution of a modern gas plant adapted to clay plant work.

To suit the majority of cases it was realized that such a plant must involve the least possible expenditure of money coupled with the greatest possible efficiency.

The building itself should be strong, as nearly fireproof as possible, well lighted, well ventilated and should have sufficient space for proper working conditions.

The "clean out" floor should be so arranged as to leave at least eight feet clear around each producer. This is necessary on account of the use of long bars for breaking down clinker thru the cleaning doors, and the fact that men cannot work too close to the open doors in hot weather. The water pans or seals should be set up on the floor like a saucer and not buried so that the rim comes level with the floor as is often done. Setting them up makes it much easier for the men to pull clinkers from under the producer and makes the removal of clinker from the pans much easier and quicker.

BLAST PIPE CONNECTION SHOULD BE ACCESSIBLE

A man-hole and tunnel should be provided at each producer giving access to the blast pipe connection with the grate. It is possible for the blast pipe to become choked and, if it is inaccessible, the producer must be shut down and emptied before repairs can be made or else an excavation must be made under the producer.

The blower pits should be in a well-lit, accessible location. Each pit should be built so as to allow a man to get down into it and make repairs. All connections between blower and grate which are placed underground and are inaccessible, should be made of sewer-pipe. To bury light metal pipes underground leads to troublesome and expensive repairs.

Each blower should be provided with a steam gauge and a draft gauge, and the main steam line from the boiler should be provided with a regulating valve to insure constant pressure. Each pit should also be provided with a steam jet or ejector for keeping the condensation down to the proper level. Fig. 21 shows the arrangements described above.

AVOIDING SHUT DOWNS FOR BURNING OUT

During the operation of a gas plant the greatest accumulations of soot and tar are found in the main gas flue just beneath the points where the "down takes" from each producer enter this flue. This accumulation chokes off the gas supply and occasions frequent shut-downs for burning out. A way of avoiding this trouble by providing a method for cleaning out the flue is shown in Fig. 22.

Under each "down take" is built a chamber which opens by means of wickets into the clean out floor of the producer house. The accumulating soot and tar falls into the upper part of this chamber onto an iron plate. As soon as a sufficient quantity has accumulated to interfere with the gas flow in the flue, the plate is pulled out and the soot and tar falls into the lower part of the chamber. The plate is then replaced and the lower wicket opened for the removal.

The main gas flue *should never be tied into or built tight against* the wall of the producer house. If this is done the expansion of the flue will either wreck itself or the wall. A cinder cushion should be provided between the flue and the wall to take the pressure.

All window openings on the cleanout floor should be near the ceiling to allow for the easy escape of gas and heat during the cleaning of the producers.

The floor of the charging room should be fireproof and capable of carrying a load of at least twenty-five tons for each producer. Shipments of coal cannot always be regulated and it is well to provide for ample storage to prevent expensive rehandling of fuel.` Comparatively, so little fuel is required on the average plant that it scarcely pays to consider automatic feeding hoopers above each producer. However, a coal

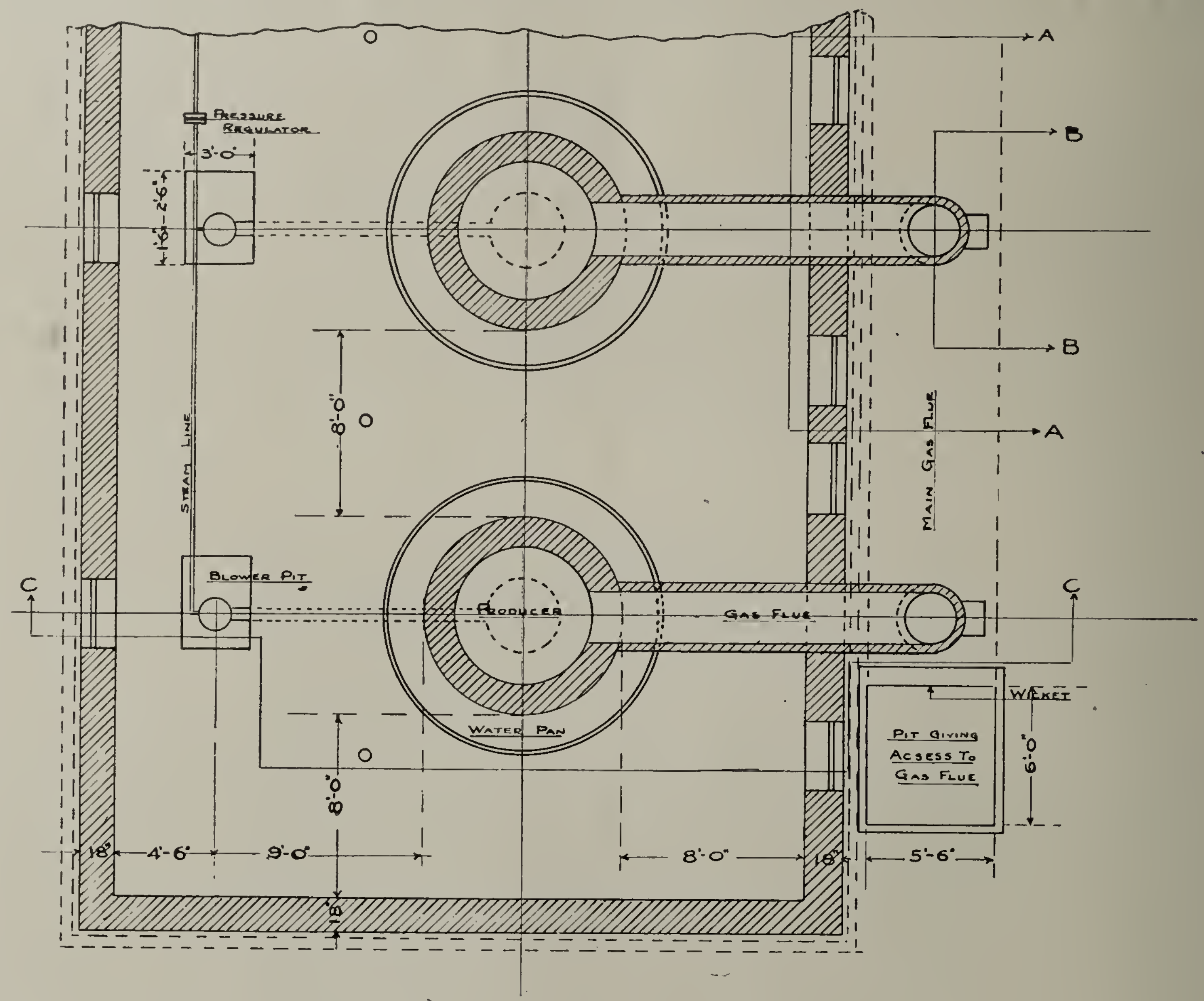
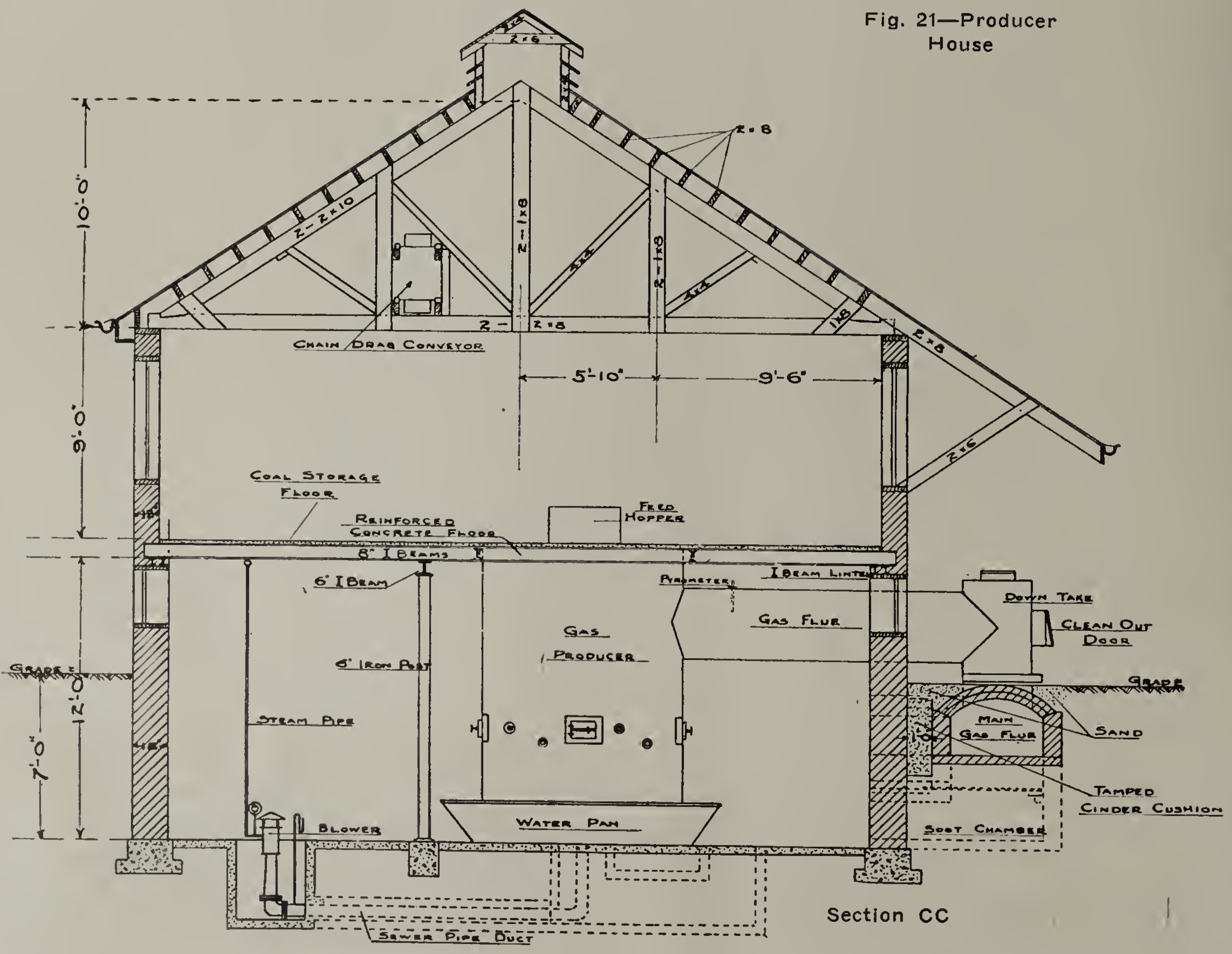


Fig. 21—Producer House



Section CC

unloading device consisting of a track hopper, elevator and conveyor, which will drop the fuel beside each producer, is an investment worth consideration. Its value will depend, however, upon the size of the plant. The same sort of outfit should also be considered in connection with a coal-fired kiln, except in this case, the fuel would be conveyed to the top of the kiln. To say the least, handling coal by hand from the modern hopper bottom coal car to a point above the car's sides is a difficult, nasty job and some kind of mechanical handling has become almost essential.

Care should be taken to have the roof of the charging room high enough to allow for the use of the long pokers which are necessary. These pokers are nearly as long as the producers are high, and the roof, therefore, at the point above the poke holes, should be somewhat higher than this measurement, especially as the pokers have to be handled with a block and tackle.

A monitor should be built the entire length of the roof to allow for the escape of gas.

SMALL PRODUCERS BETTER THAN LARGE ONE

In determining the size of the producer to use it should be remembered that two small ones give far better results than one large one, or four small ones better results than two large ones. The small producer is much easier to handle in every way, and the greater the number of producers used, the more even is the gas flow. The fuel consumption is more likely to be lower on a number of small producers than on a few large ones because there is not the tendency to push the small ones in order to maintain the flow of gas. As one man can look after six six-foot producers without trouble, there is no labor to be saved by putting in a smaller number of large producers. In fact, there are some plants which are operating two nine-foot producers which require two and sometimes three men on each shift, while others are operating five six-foot producers with one man, and doing it easily.

As the design of gas producers has become a specialized branch of engineering, it is by far the best policy to have some company, specializing in this line, furnish producers when required. Each coal has its own peculiarities and there is *no producer made which will give satisfactory service in all cases,* and certainly no one who has not had very wide experience with different kinds of coal, is competent to design a producer for a plant where the number of different coals available are limited. It is possible, however, for experts to design successful producers for any kind of service, whether the fuel be wood, peat, lignite, anthracite, or clean or dirty bituminous coal.

Clayworkers erecting a continuous kiln of any type should *always* provide themselves with a competent inspector, and this inspector should preferably be an engineer. Merely putting a man on the job will not do; he must be a man with experience in masonry construction and engineering problems. Men of this kind are not easy to obtain and are expensive, but having one on the job *every minute* is as necessary as the brick and mortar. It is not so essential that such an inspector should have had previous kiln experience, altho this is an advantage, but he must know what constitutes good brickwork and must be able to straighten out the difficulties which are certain to arise even when the most complete plans and specifications are furnished. An engineer often draws a few lines on paper which appear to offer no difficulties but are extremely difficult to execute in practice. Lack of attention to business, slow thinking and poor judgment on the part of incompetent inspectors has cost many clayworkers large financial loss and has resulted in many kilns being partial or complete failures. The clayworker should move slowly in this matter and should be extremely careful about *accepting, without thorough investigation,* the men recommended by kiln builders.

The foregoing specifications for the construction of continuous kilns are not intended for the exclusive use of the man who wants a *good* kiln, but represent what *must be done* by anybody if a kiln that will *stand up to its work and pay dividends* is to result. A more severe set of specifications may be followed, but if any attempt is made to "get by" with anything less rigid, nothing but regret will follow.

THE RESULT OF POOR CONSTRUCTION

An example of what poor continuous kiln construction can do is illustrated in the following. A large concern which operates a battery of down-draft kilns and a large continuous kiln unit on the same plant, found that the latter saved them two-thirds of the fuel and one-half of the labor as compared with the down-drafts. However, after the continuous kiln had been in operation a few years the repairs had become so heavy that it was necessary to make a new comparison of costs. It was then found that in spite of the saving in fuel and labor which the continuous kiln effected, it had cost *twenty-three cents per thousand brick more to operate it than the down-draft kilns.* Not only had the saving, made by cutting off two-thirds of the fuel cost and half the labor cost, been utterly wiped out, but twenty-three cents per thousand had been added. By what? *Repairs.* And this is the tale the cost sheets of many continuous kiln users would tell if they could but be consulted. As has been already stated, the men who have built continuous kilns heretofore have been the pioneers, it is they who have been paying for the experience which can only be bought in this way, and if the builder of the future will not benefit by the lessons learned by those who have gone before, he is simply courting disaster.

It is well to beware of the man who offers to build a *cheap* kiln and also it is well to consider carefully the "estimates" usually presented by kiln builders. When reliable information is wanted go privately to the men who have been operating kilns for several years, and as a general rule, it will be found that they are only too glad to help others avoid the pitfalls into which they themselves unwittingly fell. It will be well to give up all idea of a continuous kiln unless there is a willingness to spend the money to produce the very best of construction obtainable.

(*Concluded.*)

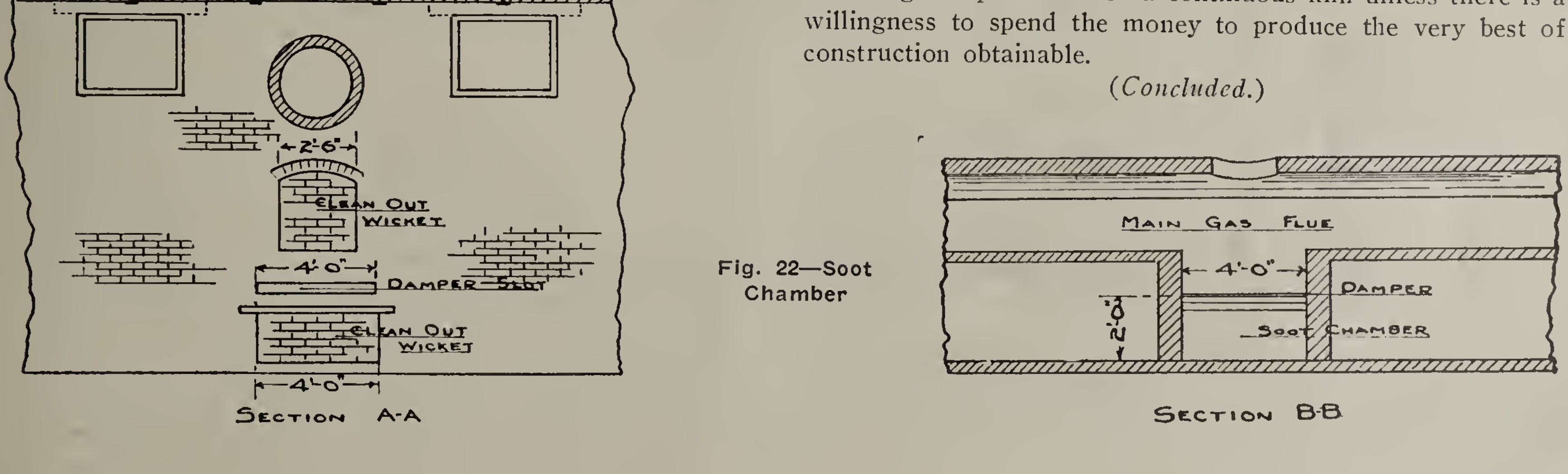


Fig. 22—Soot Chamber

In This—the First of a Series of Articles Following the Introductory Paper Which Was Published in the May 16 Issue—Mr. Anderson Reveals Some of the Possibilities That Lie Before the Drain Tile Manufacturer for the Development of His Business.

The Succeeding Articles Will be Looked for With More Than Ordinary Interest, as He Has Made a Very Careful Survey and Analysis of the Drain Tile Market and Has Devoted a Number of Years of Effort and Study to the Proposition.

A GLIMPSE *into the* FUTURE *of the* DRAIN TILE BUSINESS

By John W. Anderson

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IN MY ADDRESS before the Iowa Clay Products Manufacturers' Association at its last annual meeting at Ames, Iowa, which was published in the May 16 issue of this paper, I endeavored, in a limited time, to cover in a general way the possibilities of promoting the use of drain-tile, with particular reference to the value of making farm drainage a matter of public record as a means to that end.

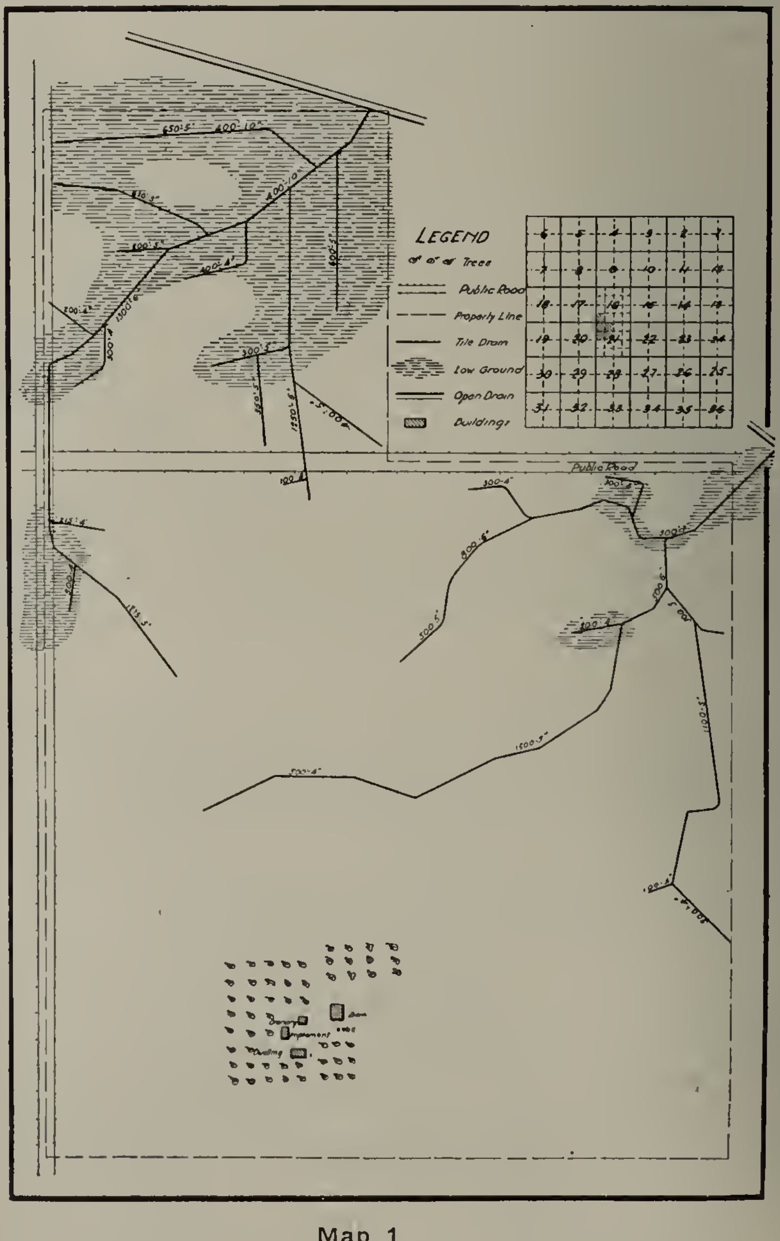
Before discussing any of the details of methods for promoting drain-tile sales it will be well perhaps first to consider the inherent possibilities of the market and to define as closely as possible the limit beyond which it may be agreed that further progress cannot be expected. In approaching the subject from this angle we quite naturally go back to the beginning of the drain-tile business in the United States and follow its history. Its development, past and prospective, we believe may properly be divided into three general stages.

EARLY HISTORY AN UP-HILL FIGHT

Tile manufacturers who have done the real pioneering in the industry will remember the difficulty with which tile were introduced in new territory. All sorts of adverse arguments were offered by "leading" farmers. Many of them insisted on writing articles for the local papers in which they warned the community against the danger of draining all the water out of the country and making it a regular Sahara.

The court records in a certain county in Minnesota show that not many years ago a drainage contractor was enjoined when he started to put in the first tile ditches known in the county. This injunction was issued on the prayer of residents who claimed that tile drainage was contrary to public policy and would ruin the agricultural prospects of the state. The injunction, of course, was set aside.

Another contractor, at a point not far distant, in order to demonstrate the value of tiling, found it necessary to put in a trial system of drainage at his own expense, give a heavy bond to indemnify the land owner against



Map 1

loss of the tract drained, and to agree to wait for payment for the trial installation until the land owner evidenced his conversion by actually laying more tile. He collected in full in less than a year.

Such periods, while usually not of long duration, have made the drain-tile business in its earlier history in any community rather an up-hill fight. From this condition, however, thru the labors of the tilemaker and thru the success of the drainage actually put in, the business has passed to the second stage, where tile are recognized as a good thing, but valued principally as a means of draining off surface water.

PIONEERS DRAINED ONLY WET SPOTS

The early practice was to lay tile somewhat along lines shown in Map 1. At first the tendency was to use the smallest of tile with the idea that it was the economical thing to do. These small tile were well worth the land owner's investment if they did nothing more than convince him that tile drainage had possibilities. As a matter of fact they usually paid for themselves the first year, and were replaced by larger tile before many seasons passed.

In Map 2 is shown a somewhat more liberal plan. The system used here is fairly representative of the practice followed in the second stage of development. It will be noted that the application is restricted, insofar as the use of laterals is involved, to the "low spots."

It requires but a glance to perceive that the general adoption of the practice shown in Map 3 would create a market for drain-tile compared with which all past demand would seem insignificant.

This map shows a multiple parallel lateral system with the lines of tile fifty feet apart and, no doubt, will seem, to many, to represent a case of over-drainage. Nevertheless, the manager of this property stated to the writer some time ago that he expected eventually to double the number of laterals by laying a line of tile half-way between each of the present lines.

HUGE RETURNS FROM PARALLEL LATERAL SYSTEM

Results obtained by this system have shown such a large return on the investment that one would have to be prejudiced indeed not to accept them as conclusive evidence of the feasibility of such intensive tiling. Of course, we must not lose sight of the fact that different soils require different treatment, that a tile ditch will drain a wider zone in some soils than in others and that, therefore, the distance between laterals and the quantity of tile required, will vary in different localities. At the same time it is quite evident that a general condition even approaching that shown in Map 3 would mean the use of many times the total number of drain-tile already in service.

Admitting that such practice is ideal, and admitting further, that it is beyond reason to hope that it will ever prevail over all of our land requiring drainage, it is still contended that a very substantial percentage of land fit for cultivation in that territory which properly represents the market for drain-tile, will eventually be tiled along such lines.

SOME WORRY ABOUT THE FUTURE

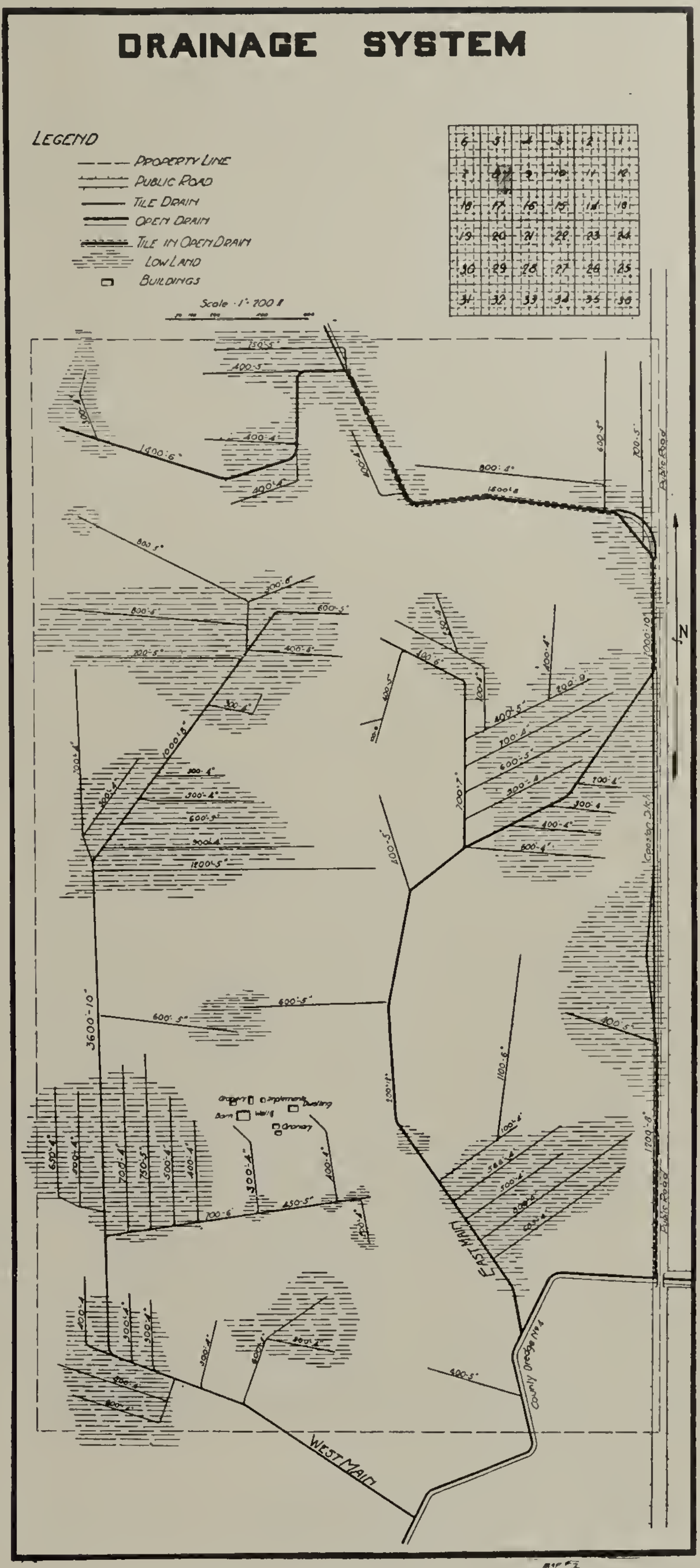
I have been asked what would become of the drain-tile business if all land were tiled in this way. The answer is that drain-tile manufacturers, if they can be induced to abandon their present destructive methods of competition, will be but little concerned about the future of the industry when they have collected a legitimate profit on enough tile to drain their territory along such lines.

I have read carefully, during the past year, a great many articles on the subject of national military preparedness, but have seen no reference to drain-tile in any of these articles. It seems that other preparedness activities are more spectacular and offer a much more attractive subject for discussion.

I believe it was Napoleon who originally announced the discovery that "an army fights on its stomach." That of course was long ago, but soldiers still have stomachs, as is evidenced by Great Britain's efforts to prevent the importation of food-stuffs to Germany, and by frequent reference in press reports to Germany's prospect for a good crop this year and to the bearing the size of this crop will have on her war strength.

DRAIN TILE HAS PART IN PREPAREDNESS

There are numerous indications that Our Country is being driven to abandon many of its wasteful practices and that, eventually, it will be forced to something resembling an old world basis in economics. Here is where the little drain-tile, in its modest way, will come into its own, not only as a factor in sustaining our nation in time



Map 2

of war, but also as indispensable to the fullest development of our agricultural resources in times of peace.

The American farmer, as a class, has been accused of robbing the soil, and it is true that, until recent years, he has been inclined to give but little attention to the necessity for replacing, in some form, those elements which he hauls away from the farm in corn, oats, wheat and other crops. Successful artificial fertilization requires a liberal use of under-drainage.

However, it is not the intention to attempt to catalog in this article the many benefits of tile drainage. This may be done at another time. Just now it is the purpose to call attention to some of the broader influences which will contribute toward the general recognition of the value of the intensive tiling of both high and low land along lines indicated in Map 3.

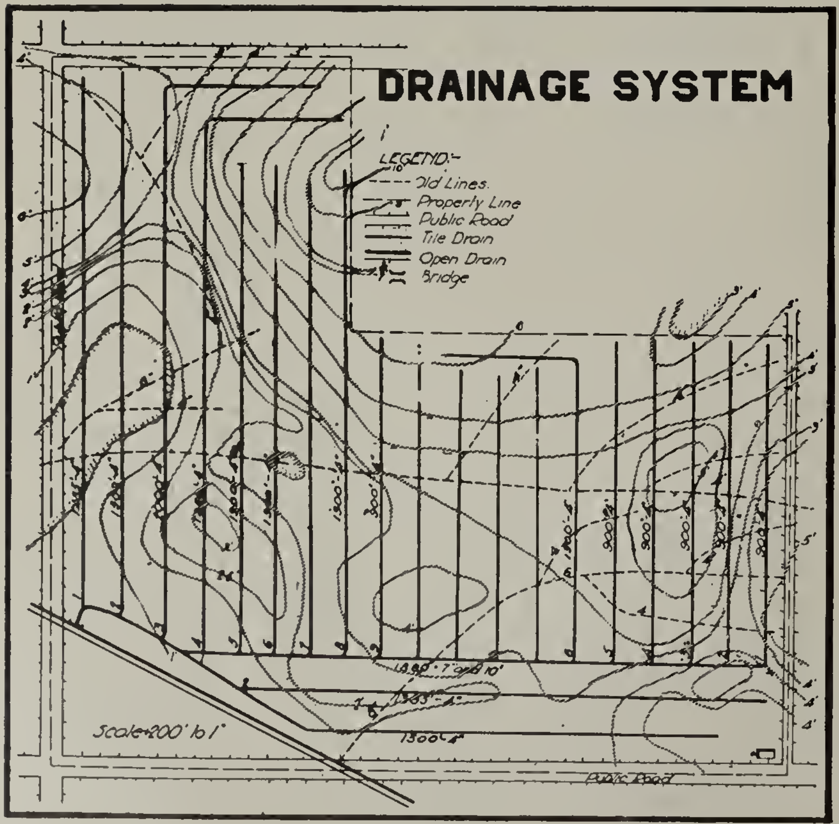
A COMPARISON OF THE OLD AND THE NEW

Map 4 will be of particular interest because it shows an instance where a drainage system similar to that shown in Map 1 was entirely abandoned in favor of a multiple lateral system. The old drains are shown in dotted lines. Even today, a majority of land owners would consider this old system adequate. Contour lines on this map show a difference of 10 feet in surface elevation between the highest and lowest point. You will note that the old drains follow rather closely the low lines, but that the recent system covers the entire tract regardless of elevation.

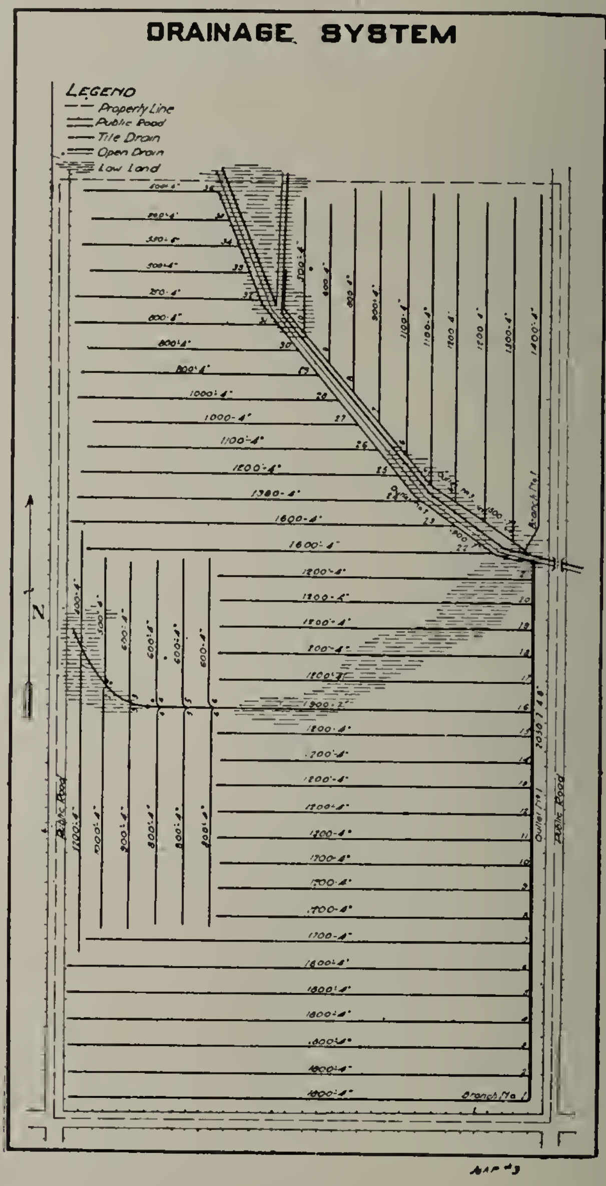
To show the great difference in the amount of tile required to drain a given acreage according to plan No. 3, as compared with plan No. 1, Map 4-A has been prepared. The dotted lines show how far an amount of tile equal to that in the old drains on No. 4, would go toward establishing the multiple lateral system later installed, while the solid lines show the additional amount necessary for the land owner to buy. The idea is not that it will ever be found advisable to take up and relay old tile. The purpose is simply to show the difference in quantities required for the two systems.

ALL MAPS REPRESENT ACTUAL INSTALLATIONS

All of the maps shown represent, accurately, actual installations and are selected from a number of such maps as best illustrating the stages in the development of drainage practice. The maps showing the multiple lateral systems are taken from installations that cannot be termed experimental. The parties owning one of these tracts already have over a thousand acres so tiled. They claim greatest protection and benefits from this system in extremely wet and extremely dry seasons. It has insured them absolutely against crop failure from any weather conditions, excepting wind and hail, and has enabled them to obtain a uniformly high yield of good quality from year to year.



Map 4



Map 3

In spite of an apparently traditional prejudice of some tile manufacturers against anything resembling a comprehensive promotional campaign in the interests of the industry as a whole, the facts upon which the writer has touched will be sure to leak out here and there and convert some land owner to the multiple laterial system of drainage.

It may as well be stated, here and now, that the writing of these articles can only be justified by a belief that there is a tendency among tile manufacturers to break away from the old habit of "waiting for rain" to bring a demand for their product, and of then going out and fighting each other with "dry season prices." There is encouraging evidence of a feeling in the industry that by improving methods of sales promotion, (or rather by really having a method) some of the uncertainties of the business may be eliminated and rapid and satisfactory progress assured.

WATCH FOR SUCCEEDING ARTICLES

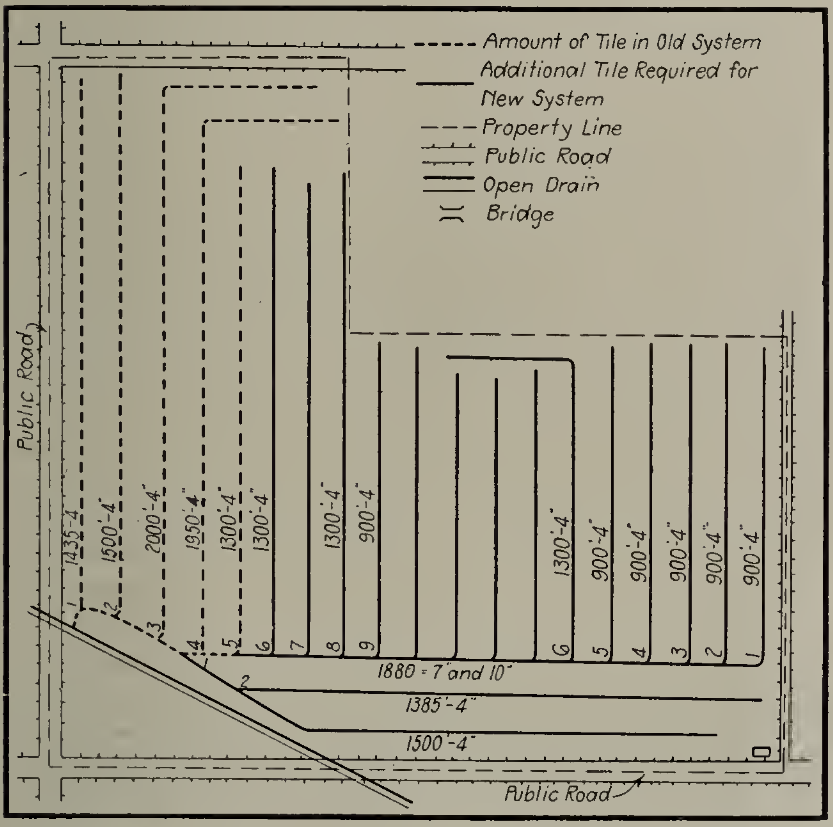
If you do not share this feeling you will probably find the weather reports of greater interest than anything that the writer expects to say. However, if you are willing to concede that the multiple lateral system may represent the beginning of a definite stage in the general development of under-drainage, and that the system may be profitably applied thruout considerable areas, you will probably find the following articles of interest. You may also agree, when the evidence is all in and the arguments concluded, that a feasible sales promotion plan based on a careful survey and accurate analysis of conditions has been outlined.

In the last article of the series the writer expects to present a method for putting the plan into operation. This method differs materially from anything yet attempted in the industry and promises a satisfactory means of "getting together" for effective constructive work.

What Ohio Plants and Dealers Are Doing

The Anders Shale Brick Company, Cincinnati, Ohio, is speeding up its work of expansion and enlargement with a view of meeting more nearly the heavy demands made for its products—hollow and common-brick. A new up-and-down-draft kiln is about ready for operation, and the company has also arranged to install a new drying system for which it is claimed that it will dry brick in eight hours instead of twenty to twenty-four, thus hastening the manufacturing process. A new steam shovel has just been purchased for use at the shale-bank, which it is believed will facilitate operations considerably. Contracts for the company's present output will take care of all the brick it can make for some time to come, and so it is desired to increase the capacity of the plant to a point where advantage can be taken of the active market which now exists.

Bids for repaving one mile of Euclid avenue in East Cleveland, Ohio, have been taken. This is part of a general improvement of the main thorofare of this Cleveland suburb, which has been the bone of contention between the Cleveland Railway Company and the East Cleveland city administration, each asserting that the other should pay for the work. The proposal is for four-inch brick on a sand cushion and cement base. The property owners of East Cleveland are "strong" for the brick pavement, the cost of which, it is said, would be considerably less than for stone.



Map 4-A. (A Glimpse into the Future of the Drain-Tile Business

The new Peerless Clay Manufacturing Company's plant at Port Homer, Ohio, is now in operation, the first batch of ware having just been made. Additions will be made to the working force at this plant from time to time. The company has been handicapped in getting started by the fact that equipment has been difficult to secure. While much trouble was experienced in opening the clay pits, west of the plant, the persistent efforts of the company have been rewarded in reaching an eleven-foot vein of clay. For weeks, workmen drilled both day and night thru solid rock before the clay deposit was reached.

Smaller jobs are occupying the attention of clay products manufacturers in and around Cincinnati for the most part just now, as distinguished from the large work that predominated last year, and which is going to furnish much activity for the building and material trades later this season. There are several very large jobs, notably the courthouse and the new Hyde Park high school, on which deliveries of clay products are either being made or will begin shortly, but for the most part the trade is busy with residence and other small work, which is being handled in such volume as to make business very good.

L. H. McCammon and Brothers, Cincinnati, Ohio, report a fair brick business, other lines of material also showing a good demand. One of the members of the firm points out the tendency to hold back on new building which is in evidence in some quarters, owing to the increasing cost of all commodities and the uncertainty which existing conditions have brought about. This, he suggests, is delaying considerable building which would otherwise be on the market, and the removal of the existing uncertainty might very well have the effect of stimulating business to a great extent.

Plans for the reorganization of the Shawnee Flash Brick Company of Columbus, Ohio, the plant and assets of which were sold at auction recently at the Franklin county court house, have not as yet been completed. An announcement to this effect is expected, however, within a week or ten days. The property is still being held by Daniel Mauger, John E. Koontz, Jacob Enlows and L. W. Tussing, who purchased it in behalf of the bondholders. The name of the reorganized concern has not been selected.

A shortage in labor is curtailing the production of face-brick, paving-brick and other clay products in the Buckeye state. The shortage is the most marked in northeastern Ohio, where steel and iron mills have attracted many of the workmen. It is also noticeable in eastern Ohio where many of the coal mines have resumed operations. The labor situation is the best in southern Ohio, where the coal mines are not as yet very busy. With the mines more active, it is believed that the shortage of labor in that section will be the worst in all the state.

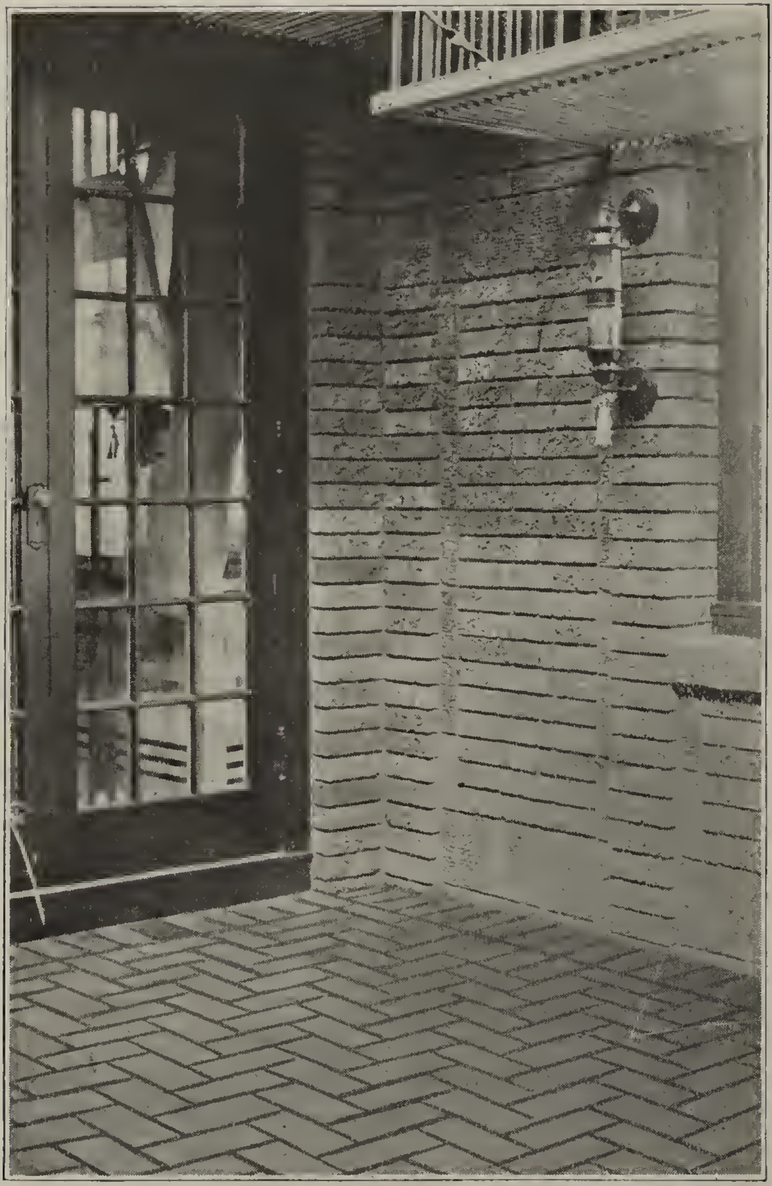
What promises to be one of Ohio's largest clayworking plants is soon to be under construction at Urichsville. The newly organized Wolf-Lanning Company, including Dr. E. A. Wolf and Theodore Lanning, has drawn up the plans and specifications for a plant to cost $150,000, which is to be in operation the coming fall. The plant will be located on a two hundred and sixty acre tract of land recently acquired by the firm from farmers residing east of Thornwood Park.

The Coshocton (Ohio) Brick Company has won out in the appellate court in its case against the Magnetic Springs School Board to recover payment for a lot of brick furnished for a school building which the board insisted did not come up to specifications. The board sold the brick at public auction and they were used in the construction of the Knights of Pythias hall at Magnetic, $300 being paid for them. The brick company sued for the balance on the amount due and recovered $438, the judgment being affirmed on appeal.

The Ironclay Brick Company is busy at its Shawnee (Ohio) plant, working a full force of men. The plant has been running on full time since it resumed operations in February.

The BANQUET HALL *of* BRICK

Taking the Name of the Product With Which It Was Built, the "Springtime Room" Described in the Following Story Affords an Unusual Example of the Decorative Possibilities of Rough-textured Brick



The Color and Texture of the Brick, Together with the Bond and Mortar Joints, Have Been Woven Into a Wall Surface That Resembles in Its Rich Tone the Effects of Finest Oriental Tapestries

WHAT IS REPUTED to be the only room in the Northwest in which the interior decoration is entirely of face-brick—even to the floor—is the product of a face-brick enthusiast who had presented to him an exceedingly difficult problem, involving the adornment of the banquet room of one of the most modern hotels in the Twin Cities.

Having decided upon the necessity of building a room of this description, the Hotel Radisson of Minneapolis, Minn., laid plans for its construction. It was so built as to adjoin the famous roof ballroom in which the elite of the "Flour City" enjoy the cooling breezes of a high altitude while they dance to music played in the midst of bizarre surroundings.

The material to be used in the construction of the sister-room of the famed dancing parlor had not been decided upon at the time the project took form, but the chances for brick as a decorative material were considered as negligible, due to the fact that only a light load could be supported by the roof upon which it was to be built—a roof not designed to accommodate an addition of this character.

Also the item of speed was an essential factor. Besides being of extremely light weight and something that had never before been perfected—something new, different and original—the banquet hall had to be constructed in a very short space of time.

As to the character of the decoration desired by the hotel management, it was decided that a scheme resembling a garden wall, or conveying the impression of creeping plant life in all its spring glory would be most appropriate and beautiful. If the room could be designed along these lines, the height of desire would be realized, they said—a desire that had a view to the comfort of the dancers who would, between the numbers, retire to the soft glowing richness of the banquet room for rest and refreshment.

Thus you see the size of the problem presented to F. B. Martin of the Twin City Brick Company for solution. The results of Mr. Martin's efforts are pictured in the accompanying illustrations. They speak well for the enthusiasm that made possible their accomplishment. Traveling along the lines of least resistance and by following his natural inclinations, he delved into the decorative possibilities of face-brick and produced a room entirely built of that material, and of a design that conformed to every requirement of weight, speed and color scheme, adding to it the prestige of originality.

The name of the room that stands as a monument to the remarkable adaptability of face-brick, itself contains a special significance, being christened upon its completion the "Springtime Room." The enthused observer, upon entering, would pronounce his conviction that the name was especially fitting. The rich, warm brightness of the walls, with the suggestions of plant life at frequent intervals, conveys a "springtime" feeling and appearance.

Not only was the room built and decorated entirely with brick, but it was named after the brick that entered into its construction. Mr. Martin, it so happens, carries in his office a richly colored rough-faced panel to which he gave the trade name "Springtime Brick," the original beauty being sufficient to suggest the name. It was with this brick that the banquet hall was built and it was in honor of the brick itself that one of Minneapolis' leading hotels named its latest achievement in providing for the pleasure of its guests.

Needless to say, the problem of building the room entirely of brick and keeping it within the required weight limit was, at first, a perplexing one. Under ordinary circumstances, it would have been impossible—but this was not an ordinary circumstance. In order to reduce the weight to a minimum, every brick in the room was cut in half, or split lengthwise, before it was laid in its proper position, thus making them two instead of four inches thick and cutting in half the weight that would have been imposed upon the roof had the brick been of the ordinary size.

Following upon the heels of the solution of the problem of weight came that of design—a problem that consumed hours of study before a satisfactory plan could be evolved.

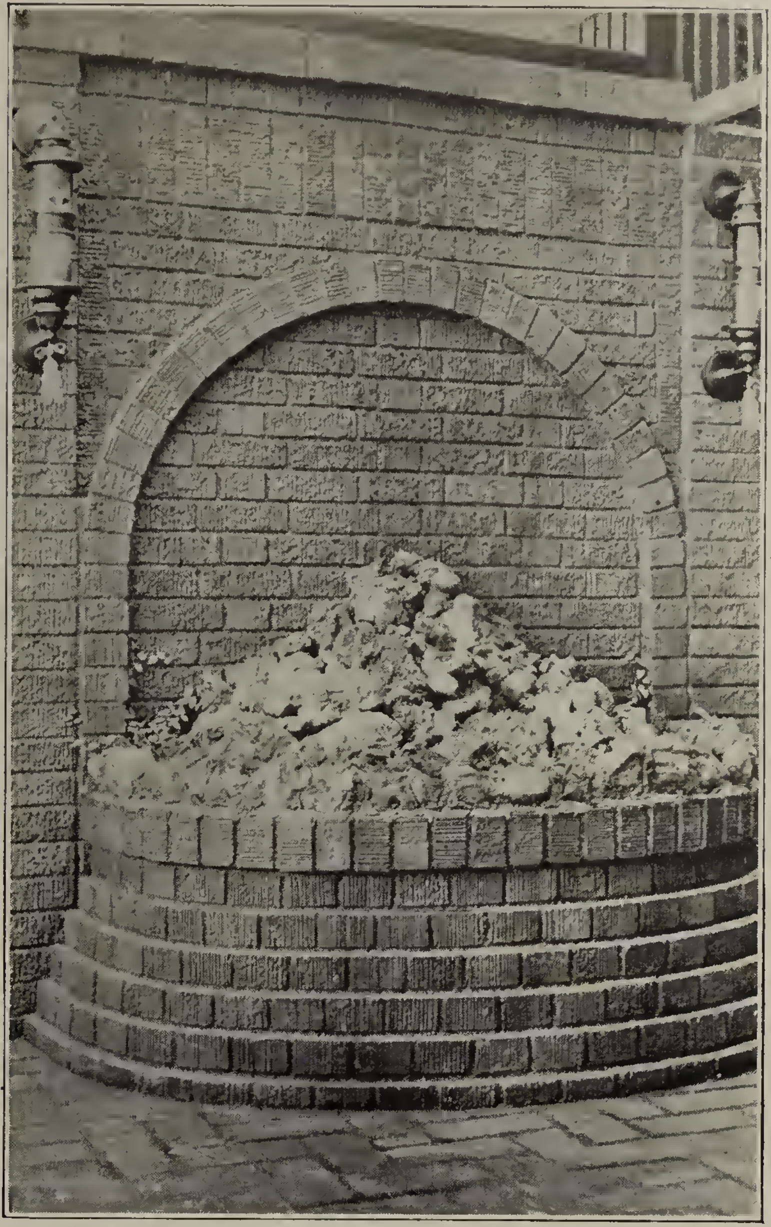
While original examples of uses for face-brick in wall decoration are to be found frequently, it is a question if its use in the laying of banquet hall floors may be uncovered in very many instances. Altho it was at first contemplated to use floor-tile that would carry out the color scheme of the remainder of the room, the pressure of time and the call of face-brick defeated the use of that material. These brick, like the rest, were cut in half giving the entire wearing surface of an ordinary brick but allowing only half the thickness.

Laid in herring bone pattern, they create an impression of intricate tracery. The joints between them are, naturally, struck flush with the top of the brick, a smooth, even floor being thus obtained. The cool, sure surface of burned clay affords a pleasant relief and a means of relaxation to the dancers who seek its atmosphere after completing the rounds of the frictionless surface of the dancing floor.

The walls of the banquet room especially present a study in brickwork. Laid up in garden wall bond, the greens, yellows, browns and rose tans, characteristic of springtime brick, accentuated by a dark chocolate-colored joint, form a glorious combination that produces a most pleasing effect. The general tones of the brickwork are green and brown, so selected to form a harmonious background for the plant life that is slowly creeping up its surface, finding an excellent support for its growth in the rough faces of the brick.

The what-might-have-been severe or mechanical lines of the walls are broken by vine pockets that have been made by corbeling out the brick from the wall for several courses. These pockets protrude about eight inches from the wall at the top course, and have a width of about sixteen inches. The brick are so brought out that a hollow space is left inside the upper courses in which may be planted vines or flowers. Around the top edge of the pockets is placed a row of clinkers, taken from the over-heated portions of the kiln, to lend a rustic appearance. Queer, grotesque wire shapes, superimposed by Chinese heads, form supports in each of the pockets upon which the vine can climb. The ultimate effect will be that of a garment of green plant life, woven around the figures of Oriental images.

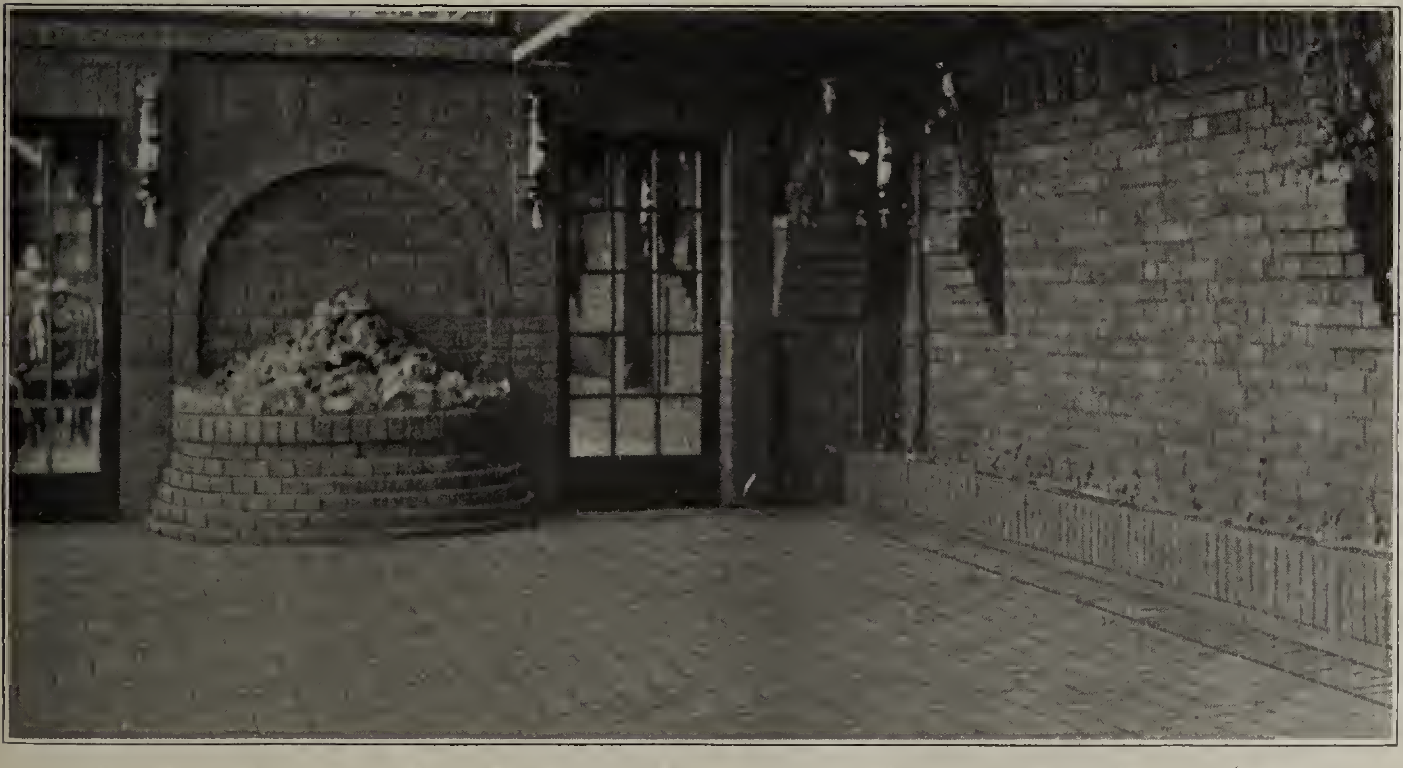
A further touch of originality is given the room by the brick flower boxes that run along the bottom of the inner wall. Creeping vines that have been placed in them have already progressed several inches over the lower courses of the brick. Altho the full beauty of the colors of these vines, springing from the boxes that have been made by laying the brick on edge, and the colors of the brick wall cannot as yet be fully appreciated, the passing of a few years will find in impressive blending of the man and Nature-made colors.



A Masterpiece in Brickwork—the Fountain at the South End of the Banquet Hall

Possibly the most beautiful example of brickwork in the room, if any one thing can be chosen and termed the most beautiful, is the brick fountain at the south end. Here indeed is the beauty of brick design unfolded and its remarkable adaptability displayed.

Built on a semi-circular design, with an arch of headers in the panel behind forming a crown above it, it has a majestic appearance presiding over the mirth of gatherings. The base is made by stepping up several courses of headers, laid upon the face,



The Severe Lines of the Walls Have Been Broken by Vine Pockets, and Flower Boxes Near the Floor, Which, It May Be Noted, Is of the Same Material as the Walls each about an inch back from the edge of the preceding course. The uppermost row extends out a slight distance over the face of the course directly below it, and the headers are laid upon edge instead of upon the face.

In Sharp Contrast to the Gaudy Decorations of the Ballroom, the Rich, Soft Tones of the Banquet Hall Make a Very Favorable Impression Upon the Chance Visitor

Sloping up from the last or top course is an imitation rock pile that embraces more of the originality that has characterized the room, the "rocks" being in reality clinkers that have been gathered from the tops of over burned kilns and from close to the fire-boxes. The clinkers are laid upon glass plates, below which are placed several electric lights. Sprouting up from the crevices of the "rock pile" are strands of growing vines, seemingly fingering their way over the rough surfaces and interweaving their slender branches with those issuing from another nearby hollow.

Here is all the splendor of a beautiful creation. In the midst of evening gatherings, rays of light that find their way thru the spaces between the rocks, overwoven with an inextricable tangling of vines, play with much beauty upon the falling water that runs over the glass surface in a sparkling, silvery sheet.

The subdued lighting afforded by quaint Chinese lanterns of a peculiar style produces a glow that brings out, in a mellow tone, every attraction in the room, making a striking contrast to the gayly-lighted and the adjoining bizarre ballroom.

The mirrored doors at the south end tend to make the room appear much larger than it really is, duplicating on its silvered surface the only entirely-brick room in the Northwest.

CRISP NOTES *from the* KEYSTONE STATE

John C. McAvoy of the McAvoy Vitrified Brick Company, Philadelphia, Pa., reports that while business has been a trifle below normal with his company, there is every indication that a favorable summer season will be experienced by the trade. Mr. McAvoy declared that there has been a decided increase in the use of vitrified brick as a paving material thruout the state of Pennsylvania and that an excellent volume of business has been coming in from that source. He states that the general revival in business that has been experienced thruout the eastern section of the United States will naturally tend to make this summer a busy one for brickmakers.

The idle plant of the Youngsville (Pa.) Brick Company, one of the three plants of the Foster Brick Company bought by Mundy and Company at a bankruptcy sale some time ago, has been purchased from the latter company by a newly organized concern composed exclusively of Youngsville capital. It is planned to operate the plant very shortly, employing a force of about thirty-five men. C. E. Foster, formerly of Kittaning, and an experienced brick manufacturer, has been engaged as manager of the company.

Altho the high prices for brick, structural steel, lumber and other materials have probably acted as a check on the starting of new construction in Philadelphia and vicinity, the volume of building permits taken out in April indicates that considerable activity prevails generally and that, as a whole, conditions are very satisfactory. Manufacturers of building brick report the receipt of considerable business recently and that the outlook for the future is very promising.

The report comes from Allentown, Pa., that the Ochs and Frey Brick Company of that city has granted its employes a twenty per cent. increase in wages. This concern is extremely busy at the present time owing to the extensive building operations in and around Allentown. More than fifty employes are affected by this increase.

Prominent members of the industry in Philadelphia and vicinity report very satisfactory trade conditions during the past few weeks. While the weather has been of such a nature as to retard the progress of building, the general prosperous condition of practically every commercial and industrial line of business has more than offset this handicap.

At a public sale, by the state, of the old abandoned factory buildings of the Hickok Manufacturing Company at Harrisburg, Pa., the Rick-Ryan Brick Company of that city purchased a motor house and two storage sheds, together with a dust house, dry kiln, scrap house and the boiler room.

Brick plants in the vicinity of Menomonee, Wis., have resumed operations. The Excelsior Brick Company and the Wisconsin Red Pressed Brick Company have both started with a force of fifty men. Yards Nos. 2 and 4 of the Hydraulic-Press Brick Company have been opened and the sheds that were recently destroyed by fire are being replaced. A very encouraging market is reported in this territory.

The common stock of the Harbison-Walker Refractories Company, Pittsburgh, Pa., was placed on a six per cent. dividend basis at a meeting of the board of directors held on May 15. This stock formerly brought four per cent. A regular quarterly dividend was declared at this meeting for one and one-half per cent.

The James G. Chrispin Lime and Cement Company, which handles sewer-pipe and tile, is contemplating some additions to its sales force which will add materially to its strength.

A well-known Cincinnati brick salesman is named as one of those who will join the company. No brick lines will be added at present, however, according to Mr. Chrispin.

The property of the Lehigh Fire Brick Company, occupying a parcel of ground along the spur of the Lehigh and New England Railroad, and extending from Railroad street to the Canal, Allentown, Pa., has been purchased by the Bryden Horseshoe Company of Catasauqua.

The capital stock of the Penn Clay Company, operating on Paddy's Run, has been increased to $40,000. The company proposes to make many improvements at its plant and to build a private rail system to a point west of Renova, Pa.

The Orleans Coal, Oil and Gas Company of Pennsylvania, has been incorporated with a capital stock of $200,000 to quarry coal, oil, gas and fire-clay and to manufacture building materials.

The Crowl Brick Company of Elysburg, Pa., recently received a very large order calling for all the brick to be used in the construction of a huge silk mill being built at Shamokin, Pa.

M. L. Low, George L. Low, H. B. Meas, Fred Holmes, W. B. Kocher, J. E. Shuman and H. G. Phillips were recently elected directors of the Bloomsburg (Pa.) Brick Company.

The Atwell Brick Construction Company has been organized at Pittsburgh, Pa., with a capital stock of $5,000 by Joseph Atwell.

Manufacturers on Raritan River Form Newest Association

Brick and other clay products manufacturers in the Raritan River section of New Jersey have organized the Monmouth Manufacturing Association with the object of bettering manufacturing and market conditions. The president of the newly formed organization is J. A. Fitzinger of the National Fire Proofing Company, Lorillards. George J. Craigen of the Craigen Brick Company, Cliffwood, is first vice-president; Bennet K. Eskesen of the Matawan Tile Company, second vice-president; Cleveland E. Watrous of the Munning-Loeb Company, Matawan, secretary, and W. A. Gill of the Renwreck Company, Keyport, is treasurer.

Needless to say, the association aims to promote the prosperity of its members, but it also hopes to secure a better understanding between employer and employe, to develop more efficient business methods and to establish a high standard in the various products of its members.

At the May meeting of the association more than thirty representatives of plants in the Raritan River district were present, and about forty more are expected to be admitted to membership at the next meeting on June 7.

Lehigh (Ia.) Clay Plants Make Improvements

With the loss of but one week in adjusting labor differences that appeared at the outset to be acute, the clay plants in the vicinity of Lehigh, Ia., are now being operated to capacity. Many improvements are being inaugurated at this time when large stocks permit of their being made without interfering with shipments. The Lehigh Sewer Pipe and Tile Company, which has enjoyed the distinction of being the only plant north of Kansas using oil as fuel in round down-draft kilns, is about to remove its oil burning apparatus because of the prohibitive cost of fuel, and plans to use coal instead of oil. For three years the oil-burning system at this plant has been productive of good results. The change will require considerable work in each one of the kilns, since the fireboxes will have to be reconstructed to conform with the requirements of a coal burning kiln. Besides this work, the runways between the kilns are being rebuilt and improvements in the machine-room equipment being made.

At the plant of the Lehigh Clay Products Company, a number of improvements are being planned.

Paving Brick Plant Plans Ball Park

A new "stunt" in the field of brick plant sports is being "pulled off" by the Purington Paving Brick Company of Galesburg, Ill. This company is fixing up a baseball diamond and is encouraging the formation of teams on its four plants, three of which have already arranged their batting line-up.

This is the second diversion that this company has arranged for its employes recently, the first being a weekly publication that it distributed among the workmen and those employed in the office, keeping them informed of interesting happenings on the plants, and offering a means of keeping personally in touch with the men. Now another step has been taken in the right direction by providing a means of healthful exercise and recreation which will undoubtedly redound to the benefit of the company in better-satisfied workmen, for little argument is necessary to convince anyone that the diamond will be kept very busy for the next three or four months.

Art Pottery Possible with Iowa Clays

"Iowa could be the greatest art pottery producing state in the Union if she would simply develop her unlimited deposits of high grade clays which lie along the Des Moines river and its tributaries," says Homer F. Staley, Professor in Ceramics at Iowa State college.

In view of this the department has announced its intention of hiring next fall an eastern art pottery expert to co-operate with Mr. Staley in tests to be carried on to demonstrate the unsurpassed quality of these deposits. They will produce an exhibit that will be shown at the state fair and elsewhere.

"These deposits are just as high grade a clay as is used in making Rookwood, Van Biggle or any of the other high class art potteries," says Mr. Staley. "Iowans need to be awakened to the enormous possibilities of developing this industry."

From "Power"

A Good Way to Miss Opportunity

TESTING *Clay* REFRACTORIES

In Which Are Described the Methods Followed in Classifying Fire-clay Shapes for Industrial Purposes

By A. V. Bleininger, B.Sc.

In a Paper Read Before the New Jersey Clay Workers' Association.

THE TERM FIRE CLAY, as commonly employed, is a flexible one. As the name indicates, it is supposed to cover a class of clays which is fire-resisting, but in order to give it a definite understanding, it will be necessary to establish certain limits. The most ready means of fixing these limits is offered by the so-called fusing point.

Unfortunately, clays do not possess a definite melting point like the pure metals and minerals, and hence it has been found necessary to make an arbitrary assumption as to what should be called the fusion point. It is customary to mold the clay specimen in the shape of a small cone which, after drying, is placed in the testing furnace and heated until it bends and its tip touches the clay support. This so-called cone melting or deformation point is also affected by the rate of heating. Rapid firing results in a higher deformation temperature than a slower rate of heating. Fortunately, the higher the temperature involved, the less marked seems to be the influence of the rapidity of firing. Reducing gases also tend to lower the apparent melting temperature. The fusion test may be made in a simple gas-fired pot furnace, in a small coke-furnace supplied with air blast, or an electric furnace. The first type of furnace will answer satisfactorily for lower grade fire clays, while the second and third may be used for the more highly refractory materials. For quick and convenient working the electric carbon resistance furnace is to be preferred. Such furnaces have been frequently illustrated and described.†

MELTING POINT DETERMINED BY SEGER CONES

For the estimation of the so-called melting point the Seger cones probably offer the easiest means available and their use is so well known that nothing need be said concerning them. Usually three or four cones of different numbers are placed in the furnace with the specimen of clay to be tested. The softening point of the cones is, of course, indicated by their complete bending over and the same holds true for the cones made from the clay. The high fusing cones are much smaller than the ones employed in firing kilns. Owing to the fact that we are not concerned here with true melting points, it would be well to express the softening points of clays in terms of cone numbers. Since both the clay specimens and the cones are subjected to the same heat treatment during the test, the comparison is fair, especially if we realize the fact the cones themselves are largely composed of clay. The determination of the melting point of clays by means of pyrometers presupposes invariably that the rate of heating be specified. By very rapid heating a clay could be made to show a higher softening point than upon slower firing. Unfortunately, people seem to prefer to have this point expressed in degrees and do not seem to be satisfied with the mere cone numbers. This is a mistake and considerable confusion and error is caused by this practice.

It is of course possible to determine the softening temperature of clays by means of pyrometers. They can be operated by any intelligent person, but require care as to adjustment, if they are to give consistent readings.

FIXING LIMITS FOR VARIOUS CLAYS

Having considered the means of obtaining the softening points in terms of Seger cones, we must discuss the proper limits to be fixed for No. 1 and No. 2 fire-clays. It has been found that the purest fire-clays fuse at about cone 35, tho some have been known to go to No. 36. Some dispute has arisen as to the line between the two classes of fire-clays. From the writer's experience he would say that cone 31 should mark the lower limit for the high-grade fire-clay. A clay fusing at this point would still be considered as belonging to the No. 1 class, but one softening at cone 30 would be called a No. 2 material. It would also seem necessary to define the No. 2 class of fire-clays. From the data available in our laboratory on many kinds of clays we are of the opinion that a fusing point corresponding to cone No. 28 should constitute the lower limit for the second-grade clays. Any material fusing between this point and cone 20, should be called a No. 3 fire-clay.

The softening temperature alone, however, does not seem to suffice in fixing the grade of a fire-clay. This might be illustrated by the case of certain stoneware clays which vitrify at temperatures as low as cone 8, and yet show a softening point above cone 30. As fire-brick material, excepting for bonding purposes these clays certainly would be of little value in places where a No. 1 material is necessary. This is due to the fact that the softening point is deceptive as far as the actual standing up quality of a refractory is concerned. In order to bring out this quality of a clay, the so-called load test has been devised. In this test a full sized brick is made of the clay and burnt to about cone 10. This brick is then placed in a special furnace and set firmly on a solid bottom, on end. Thru a hole in the crown of the furnace a cylinder made of a very refractory clay is introduced which rests on the brick. A load of fifty pounds per square inch is then applied by placing a suitable weight at the end of a steel I-beam nine feet long with a distance of three feet between the pin taking the upthrust and the fulcrum, and six feet between the latter and the point of application. The furnace is then heated at a rate so that the desired temperature, 1350° C. (2462° F.) is reached in about five hours; this temperature is then maintained constant for one hour. The heat is controlled by means of a thermo-couple pyrometer. Upon completion of the test the specimen should show no decided deformation or cracking and the contraction in height should not be more than 7 per cent of the original height.

This test brings out first of all the degree in which the material tends to soften and hence it is a modified refractory test. A high-grade clay will have no difficulty in passing under this specification, provided it is shaped into a well made brick. From numerous tests it appears clearly that the content of fluxes is the primary factor governing the behavior of clays in the load test. Likewise it has been found that the more silicious a fire-clay is the more potent is the effect of the fluxes in reducing refractoriness. Silicious clays, low in fluxes, like many of the New Jersey fire-clays, stand up magnificently in the load test, and hence are especially adapted to severe service where heavy loads are to be carried at high temperatures as in gas benches. On the other hand, as soon as the fluxes become too prominent in a clay of this type, its refractoriness becomes decidedly impaired.

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†Some easily accessible references are: Technologic Paper No. 7, Bureau of Standards, Washington, D. C.; Proceedings Am. Soc. for Testing Materials, Vol. 13.

FLUXING MATERIAL AN IMPORTANT CONSIDERATION

In the study of the chemical composition of fire-clays the amount of fluxing material present becomes an important consideration. The mere statement of the chemical composition expressed in per cent as reported by the chemist is not a statement capable of direct comparison. It is advisable, therefore, to translate the figures into an expression which enables us to express the chemical composition by means of two numbers, one referring to the total content of fluxes, the other to the silica content. By fluxes we mean the basic oxides, potash, soda, lime, magnesia and ferrous oxide. Since, in the case of fire-clays, the fusing action of these compounds is approximately proportional to their molecular quantities, we are justified in collecting them under one heading and give them the general term, RO.

In thus transforming the ordinary chemical analysis into a formula we must first fix in our minds the molecular weights of the various compounds. The most important ones are as follows:

Name	Formula	Molecular Weights
Silica	SiO_2	60
Titanium oxide	TiO_2	80
Alumina	Al_2O_3	102
Ferric oxide	Fe_2O_3	160
Ferrous oxide	FeO	72
Potash	K_2O	94
Soda	Na_2O	62
Lime	CaO	56
Magnesia	MgO	40

The molecular weights are expressed in round numbers so as to facilitate calculation. Now, in computing from the analysis of the clay its chemical formula, we must carry out the following calculations:

1. Divide the per cent. of each compound by its molecular weight. Multiply the quotient obtained from ferric oxide (Fe_2O_3) by 2, and consider this the proper quotient for this component. This procedure is necessary, as at the high temperatures with which we are concerned, the iron oxide may be considered to be present as ferrous oxide (FeO).

2. Divide the quotient obtained for alumina into each of the quotients obtained and arrange the second set of quotients in three groups: RO, Al_2O_3 SiO_2.

In order to illustrate this procedure more clearly we shall take the analysis of a New Jersey fire-brick and carry out the operations indicated above. The analysis is as follows:

Silica	77.82%
Alumina	19.00%
Ferric oxide	1.01%
Titanium oxide	1.65%
Lime (CaO)	0.22%
Magnesia	0.06%
Soda	0.10%
Potash	0.28%

Carrying out the first operation we have:

Silica	$77.82 \div 60 = 1.296$
Alumina	$19.00 \div 102 = 0.186$
Ferric oxide (ferrous oxide, FeO)	$1.01 \div 160 = 0.00625 \times 2 = 0.0125$
Titanium oxide	$1.65 \div 80 = 0.0206$
Lime	$0.22 \div 56 = 0.0039$
Magnesia	$0.06 \div 40 = 0.0015$
Soda	$0.10 \div 62 = 0.0016$
Potash	$0.28 \div 94 = 0.0030$

The second operation is then as follows:

Silica	$1.296 \div 0.186 = 6.96700$
Alumina	$0.186 \div 0.186 = 1.00000$
Ferric oxide	$0.0125 \div 0.186 = 0.06720$
Titanium oxide	$0.0206 \div 0.186 = 0.11070$
Lime	$0.0039 \div 0.186 = 0.02096$
Magnesia	$0.0015 \div 0.186 = 0.00806$
Soda	$0.0016 \div 0.186 = 0.00806$
Potash	$0.00298 \div 0.186 = 0.01602$

Adding the values obtained for the five fluxing constituents we have:

Ferrous oxide (FeO)	0.06720
Lime	0.02096
Magnesia	0.00806
Soda	0.00806
Potash	0.01602
Total RO =	0.12030

Arranging the three groups in a formula we obtain:

$$\begin{array}{l} 0.016\ K_2O \\ 0.008\ Na_2O \\ 0.067\ FeO \\ 0.021\ CaO \\ 0.008\ MgO \\ \hline 1\ Al_2O_3 \\ \hline 6.97\ SiO_2 \\ 0.11\ TiO_2 \end{array}$$

Reducing this expression to its simplest terms we obtain:

$$0.12\ RO,\ Al_2O_3,\ 6.97\ SiO_2,$$

since for the most purposes the titanium oxide may be neglected. From the mode of calculation it is evident that the alumina is always equal to 1, and hence two figures represent the entire analysis, viz., the equivalents of RO and those of silica. Pure clay substance has the formula, Al_2O_3, $2SiO_2$, 2 H_2O (water). Comparing the above expression with the one just given, representing the most refractory type of clay known, we note at once that this clay is of the siliceous type having nearly 5 molecules of free silica. At the same time we observe that the amount of fluxes is very low.

It might be interesting to compare the chemical composition as expressed by these formulæ with the ability of fire-brick to withstand the load test. This comparison can be made by means of the accompanying diagram (Fig. No. 1) in which

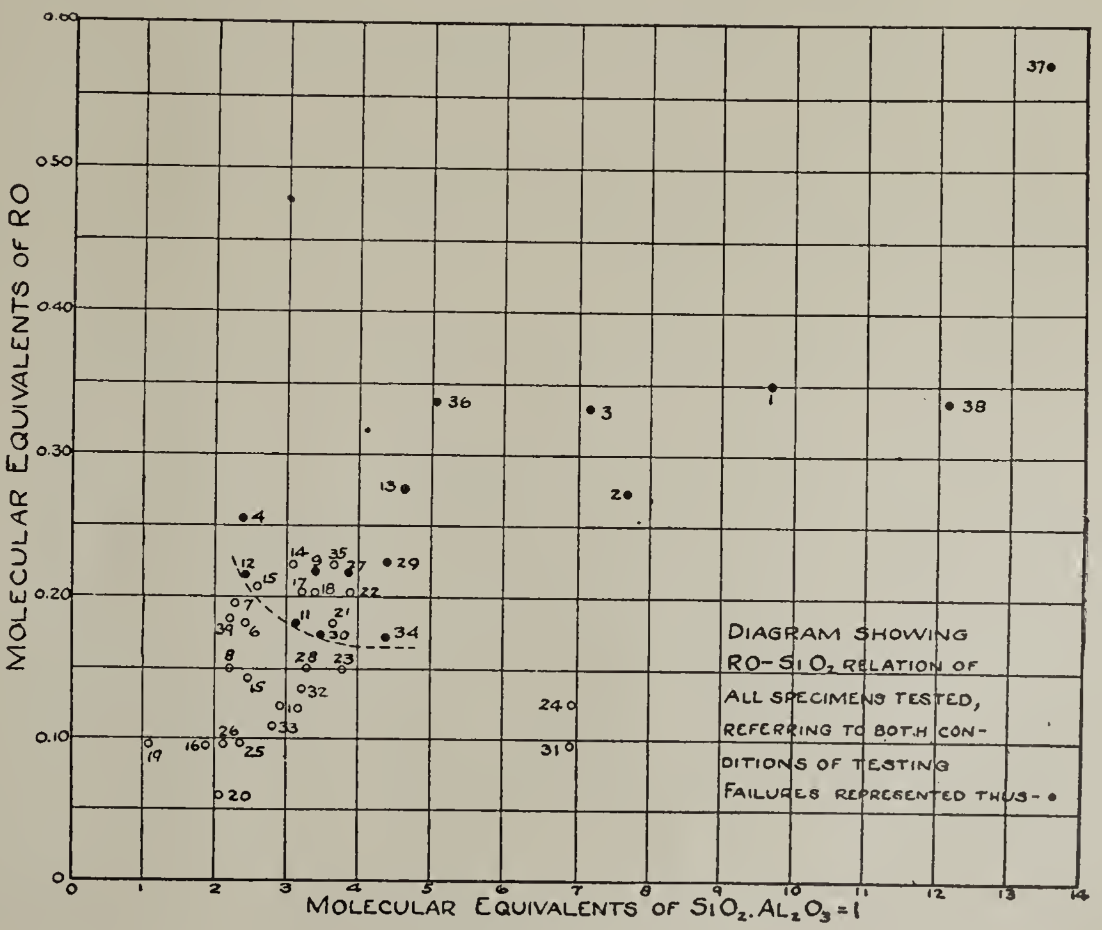


Fig. 1

the RO equivalents have been plotted along the vertical, and the silica equivalents along the horizontal lines. The brick which have failed in the load test, are indicated by black spots. Inspection of the diagram reveals the fact that no failure in the load test occurs below an RO content of 0.22. A fire-clay showing less than this amount of fluxes should be quite safe as far as this test is concerned.

One important fact in connection with fire-brick is their burning temperature. There is a general tendency to burn them at too low a temperature, and hence a decided additional shrinkage takes place in using them which may be quite detrimental. A high-grade brick, when reburned to cone 14 (2570° F.) taking about six hours to reach this temperature and maintaining it constant for at least three hours, should show no permanent shrinkage or compression greater than two per cent of the original linear dimensions. A No. 2 grade brick likewise should show no change in length greater than two per cent upon heating in a similar manner to cone 12 (2462°F.).

SPECIFICATIONS

As yet no general specifications have been worked out for refractories, and it is very doubtful indeed whether this is possible at all, as the conditions of their use vary so widely. It certainly would not be fair to demand, for instance, the same requirements for materials used in lining ceramic kilns, in gas works, in zinc retorts, or in glass tank blocks.

For gas works use the following specifications have been suggested by the writer:

NO. 1 CLAY REFRACTORIES

a. Chemical composition. The RO content shall not exceed 0.22 equivalent.

b. Softening point. The softening temperature shall not fall below cone 30 (3038° F.).

c. Load test. At a temperature of 2462° F. and under a load of 50 pounds per square inch the linear contraction shall not exceed 7 per cent of the original height.

d. Change in volume. The linear dimensions shall not decrease or increase upon reheating to cone 14 more than two per cent of the original length.

NO. 2 CLAY REFRACTORIES

For these materials no limits as to composition are fixed.

a. Refractoriness. The softening point shall not be below cone 28 (2975° F.).

b. Load test. The materials shall show no linear contraction greater than seven per cent of the original dimension when tested under a load of 25 pounds per square inch at a temperature of 2372° F.

c. Change in volume. Upon reheating to cone 12 (2462° F.), the material shall show no permanent swelling or shrinkage greater than two per cent in terms of the original linear dimensions.

NO. 3 CLAY REFRACTORIES

a. Refractoriness. The softening point shall not be lower than that corresponding to cone No. 26 (2912° F.).

b. Crushing strength. No load test at higher temperatures shall be required, but the crushing strength at atmospheric temperature shall not be less than 1,500 pounds per square inch.

c. Change in volume. Upon reheating the brick to a temperature corresponding to cone 8 (2282° F.), no permanent shrinkage or swelling above two per cent of the original length shall be shown.

These specifications, intended for gas works use, are by no means final and represent simply an attempt to start a movement towards the establishment of fair and practical requirements for this class of products. For other industries the requirements would have to be modified accordingly. Similarly, a different set of specifications would be necessary to apply to silica refractories.

Attention might be called to the fact that for the No. 1 refractories of the above specifications the minimum softening temperature was taken as cone 30, altho it was stated earlier that the lower limit for No. 1 fire-clays should be considered to be at cone 31. This is due to the fact that in many cases, as with flint fire-clay brick, the admixture of a small amount of a plastic clay is necessary to make possible the molding of the brick as flint clay is practically non-plastic. Since the plastic clays are usually of a less refractory nature, it is evident that the heat-resisting quality of the mixture is somewhat lowered, for which allowance should be made.

The amount and quality of the plastic clay used is of pronounced influence upon the furnace load test. In fact, it might be said that the load behavior of a flint clay brick is governed to a considerable extent by the plastic bond clay. Due attention is not paid to this fact in many cases and the high refractoriness of the flint clay is made to suffer unnecessarily by the careless selection of a bond clay. It has been found that by thoroly grinding the plastic clay and a certain amount of flint clay together, say, in the proportion of two plastic to three flint clay, to a fineness corresponding to the 20-mesh sieve or finer, the load behavior may be improved in a marked manner. By using, instead of the bond clay itself, such a thoroly blended mixture to which the remaining coarser flint clay is added as usual, the quality of the material is improved decidedly.

CONGRESSMAN WOULD LIMIT THICKNESS *of* BRICK WALL

A bill was recently introduced in the House of Representatives by Mr. Gallivan, "to regulate the thickness of walls in buildings in the District of Columbia." The bill, which has been referred to the Committee on the District of Columbia, in substance is as follows:

"That it shall be unlawful to construct or erect any building in the District of Columbia over fifteen feet in height, fifteen feet in width, and fifteen feet in length, composed of brick or a substitute for brick, with walls less than thirteen inches in thickness, with the exception of interior walls other than party walls.

"That all laws and regulations now in force in the District of Columbia contrary to this Act shall be void.

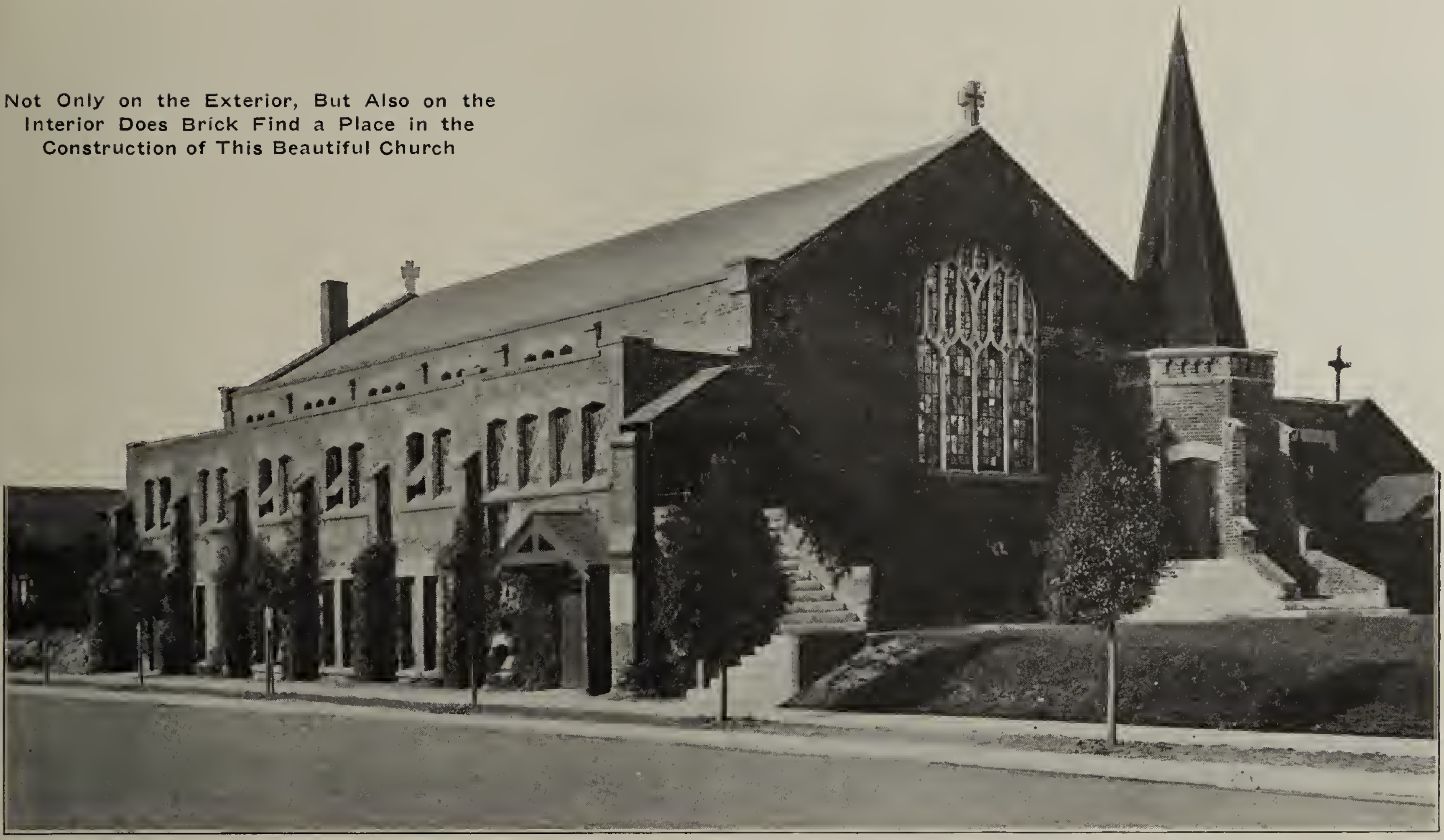
"That the Building Inspector of the District of Columbia shall not issue any permit for the erection of any building the plans and specifications of which do not comply with this Act.

"That any violation of this Act shall be punishable by a fine of not less than $500 nor more than $2,000, or not less than thirty days in jail, nor more than two years.

"That walls constructed of brick or a substitute for brick less than thirteen inches in thickness shall be condemned and demolished under the direction of the building inspector's office, and the cost for same shall be levied against the owner.

"That this Act shall take effect immediately upon its passage, but shall not apply to any building then in course of construction."

Not Only on the Exterior, But Also on the Interior Does Brick Find a Place in the Construction of This Beautiful Church



MAN'S BEST THOUGHTS EXPRESSED *with* BRICK

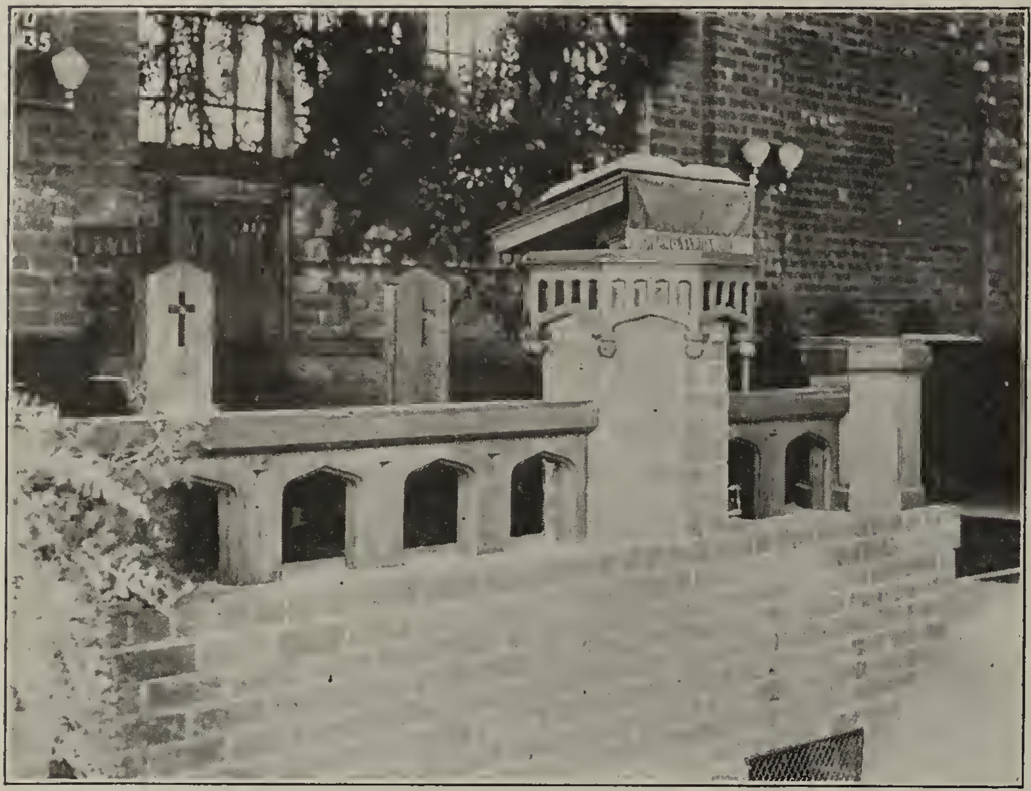
Permanence, Truth and Beauty—Inseparable from the True Church Structure—Find Their Only Adequate Vehicle in the Best of All Building Materials

By Charles Alma Byers

THAT BRICK may be used extensively and with exceptionally satisfactory results for the interior as well as the exterior of public buildings is shown in a conclusive manner in the attractive church edifice here illustrated. Of rather unusual structural lines both inside and out, the exterior of the building presents a dignified and imposing appearance from every point of view, and its interior, radiating true "churchliness," is especially handsome, seemingly perfect in every detail. It is not, however, to costly ornamentation that its beauty, as a whole, is due but, instead, to its fair proportions and its construction of worthy and lasting materials. In short, it is to the very extensive use of brick, producing both a most substantial appearance and a highly satisfactory color scheme, that the structure owes its striking attractiveness.

Altho somewhat lower and of otherwise rather modified design, compared with English interpretations, the edifice is patterned after the Tudor Gothic style of architecture. Constructed on a plot of ground that recedes toward a side street, the structure from that point has the appearance of being, and virtually is, two stories in height, altho the doorway and the lower windows of the wall on that side of the building belong to what is really the basement. The steeple which has a base of rather novel design is considerably lower than most church spires, while doorways in two of its walls comprise the main entrance to the building. On the other front corner, however, is provided another entrance, which leads both to the main auditorium and gives access to a stairway leading to the basement. The main part of the edifice has a width of fifty-nine feet and a depth of seventy-eight feet, altho, including the portion used as the pastor's study, the total frontage is seventy-five feet.

The walls are of solid brick construction, so designed as to possess a massive appearance, and all coping effects are created from brick set edgewise. A dull red brick was used thruout, laid in mortar of creamy white. The window and doorway arches are for the most part composed of cream-tinted concrete, altho exceptions are made in the case of the great gable windows and the small windows of the pastor's study and the steeple base—where arches of brick, set edgewise, are employed.



Reading Desk and Chancel Rail of Brick, Ornamented with Oak

The plan of the main floor is that of a basilica with a lofty nave and with wide aisles opening out of the arches which support the clerestory walls. All piers, arches and walls of this floor are of brick, identical with that used for the exterior, there being no plastering to cover up the strength and beauty of construction. The piers are of octagon design, and from them springs the massive and attractive arrangement of hammer beams that support the roof. At each of these points there extends toward the center a truss projection from which is suspended an electric-lighting fixture of especially attractive workmanship—an inverted dome of brass and glass, suggestive of a Roman lamp.

The arrangement of the chancel is in line with the distinct advance that many churches of the Puritan faith are making, away from the bareness that has hitherto characterized their houses of worship. The chancel floor is elevated eighteen inches above the main floor and is reached by a flight of three steps rising from the forward end of the central aisle. Central in the chancel, under the great window of this gable, is placed the communion table. On one side of the steps is built the reading desk, and on the other side is the pulpit. Both of these are constructed of brick, capped with oak tracery of rich design, and the chancel rail is also largely composed of brick. To the right of the chancel is the organ, and to the left is a small choir room.

The seating capacity of the auditorium is approximately six hundred. The main floor is level, the pulpit's elevation being sufficient so that the speaker is in view of the entire congregation.

The entire main floor is exceptionally well and attractively lighted from windows of mellow-toned opalescent glass. Small windows, arranged in pairs, admit light to the aisle sections on either side, and still smaller ones, in groups of three, are used in the clerestory walls. The great windows at each end of the nave are indeed of rare architectural beauty, and of rather unique construction. Altho the glass is comparatively inexpensive, the effect is particularly attractive, the flood of opalescent-tinted light lending a richness to the interior that could not be easily improved upon, using any other material.

The pews are of oak, finished in a dull, dark shade, and the roof beams, as well as all other exposed timber, while of pine, are so treated as to possess a corresponding color.

The vestry floor or basement includes the Sunday School rooms, class rooms, social rooms, and so forth, as well as a large kitchen and the lavatories. Here, also, is located the furnace room, from which heat is provided for the two floors.

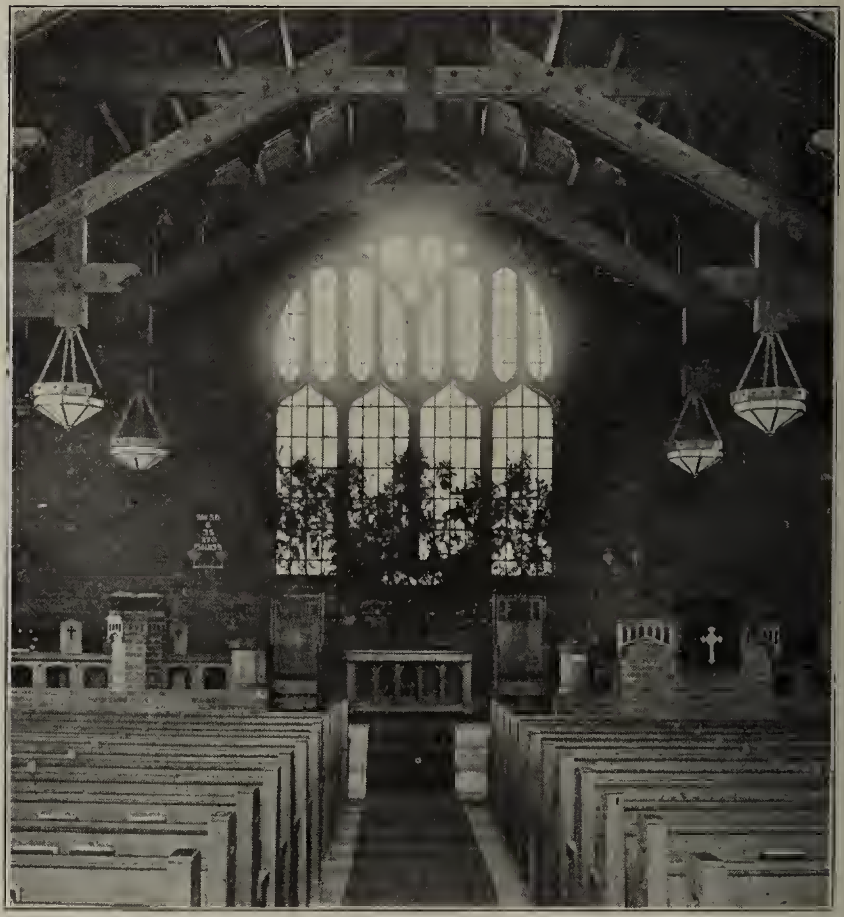
This edifice, which is the property of "The Church of the Messiah" (Congregational), is located in Los Angeles, California, and was designed by C. A. Faithful, who is director of the Department of Architecture at the Polytechnic High School of that city. The cost was approximately $13,000, as follows:

Foundation and concrete work	$2,700.00
Composition roofing (best grade of asbestos)	325.00
Wiring (in metallic conduits)	200.00
Heating plant	350.00
Plumbing	250.00
Glass sash	600.00
Chancel fixtures	250.00
Roman lamps and other electric fixtures	300.00
Pews	1,000.00
Contractor's price for labor and other materials	7,000.00

The interior of the building has been much admired and the members are more than pleased with the church "atmosphere" which the use of birch has helped to create.

Referring to the use of brick for church structures, the Hydraulic-Press Brick Company in its comprehensive booklet on the subject, states:

"There are three characteristics that the church, small as well as large, must always have, viz., permanence, truth and beauty, all of which are necessary to the appropriate expression of religion.



A Large Window at One End of the Nave, Which Is Surrounded by a Substantial and Beautiful Wall of Brick

"If brick can meet the demands of permanence, truth and beauty, it may be regarded as the ideal material in the hands of the architect for the church. There can be no doubt but that it possesses these three qualities in the highest degree.

"Tried in the fiercest flames, well-burned brick has a permanence that defies the ravages of time. It has been discovered in prehistoric ruins as sound as the day it was made; and it actually preserves for us the oldest recorded historic date.

"It is the very emblem of honesty, and always stands for its worth, a brick.

"In the matter of beauty, brick, by reason of its varied colors, especially shines. It presents to the architect the variety of the artist's palette. In addition to the color variation in brick, there are the most delicate changes of shade and tone produced by different surface textures from the brilliant sheen of enamel to the velvety effects of rough matt.

"In fact, with the color and texture of the brick, the bond and the mortar joints, the artistic builder has the material at hand for weaving into the wall surface the rich tone effects of the finest Oriental tapestries." Such are the possibilities of brick in church structures.

Ever Before the Eyes of the Congregation, This Built-with-Brick Pulpit Is Far From Being the Least Attractive of Any of the Interior Furnishings

AMONG *the* POTTERIES

At a special meeting of the United States Potters' Association held recently in East Liverpool, Ohio, differences existing between some of the divisions of pottery labor and the manufacturers were gone into thoroly. This meeting of manufacturers resulted in the following supplement to the "Chalfonte Agreement" or present wage scale being sanctioned, and which received the signatures of the proper officials of the United States Potters' Association and the National Brotherhood of Operative Potters. The agreement gives the kilndrawers an increased wage, but even at that the drawers in the East Liverpool district struck the day before the agreement became operative.

The supplement to the agreement reads as follows: "Following out the instruction of Clause 22 of the 'Chalfonte Agreement' the following uniform scale governing the drawing of glost and bisque kilns, to take effect on and after Friday, May 26, 1916, has been agreed upon by the proper representatives of the National Brotherhood of Operative Potters and the United States Potters' Association:

"The drawing of glost kilns shall be paid for at the rate of forty-six cents (46c) per hundred cubic feet for drawing each particular kiln.

"The drawing of bisque kilns shall be paid for at the rate of forty-two cents (42c) per hundred cubic feet, plus fifty cents (50c) extra on each day allowed to kilnmen for placing excess flat ware in each particular kiln.

"In case the above revision reduces the present price paid for drawing on any particular kiln, it is agreed that the present price on that kiln shall be continued.

"All other conditions, such as the twenty-five cents (25c) extra paid to the emptier or head drawer, extra pay for extra long carry or carrying up or down stairs shall remain as heretofore.

"It is also understood and agreed, that in case a crew is short one man of the normal number required for drawing that kiln, the short crew shall draw the kiln and divide the amount to be paid for the kiln. This is not intended to permit a crew being permanently reduced, but is intended to cover cases where the full crew cannot be obtained and to avoid throwing that kiln.

"It is further understood that in case the temperature of a kiln is not low enough to permit of its being drawn in the morning, an effort should be made to draw the kiln later in the day, if the temperature is sufficiently reduced.

"This is to prevent the missing of kilns and to try and avoid the necessity of drawing at night."

AGREEMENT COVERING WAREHOUSE WORK

"Since paragraph 10 of the 'Astor Agreement' does not specify a complete wage scale for warehousemen of the various terms of service, and since no uniform scale is in existence or is recognized by the parties to said agreement, the Labor Committee of the United States Potters' Association and the proper officials of the National Brotherhood of Operative Potters, in order to clarify and elaborate said paragraph, do hereby agree to the following scale to become effective on and after Monday, May 22, 1916:

First three months	$2.00 per day
Next nine months	2.25 per day
Second year	2.35 per day
Third and fourth years	2.50 per day
After the fourth year	2.75 per day

"Above scale to apply to male employes of over eighteen years of age.

"Nine hours shall constitute a day's work for all time excepting pay Saturday, which shall be eight hours.

"The conditions governing the payment of the journeyman price of $2.75 per day shall be those recited in paragraph 10 of the 'Astor Agreement' with the privilege of appeal to the Standing Committee in any case abuse is alleged."

The agreement was signed by W. E. Wells, chairman of the labor committee, Charles F. Goodwin, secretary of the potters' association, and Edward Menge, president and John T. Wood, secretary-treasurer of the Brotherhood.

Gilders and liners who seek to have a "closed shop," and who are in a union independent of the Brotherhood, have received no consideration from the manufacturers.

The sale of the former plant of the American China Company at Toronto, Ohio, to the Hartje Paper Company of Pittsburgh, Pa., has just been announced. This plant was recently considered as a possible purchase by the Steubenville (Ohio) Pottery Company, but as most of the machinery had been removed, the proposition was given up. The kilns in the Toronto plant will be razed and papermaking machinery will be installed as early as possible. The pottery has not been in operation for several years, and was last under the management of Thomas Price, late of the Consolidated Pottery Company, Grafton, W. Va., and Jefferson R. Warner, now located on the Pacific coast.

Plans are being drawn by an East Liverpool (Ohio) architect for the erection of a new seven-kiln pottery near Bristol, Tenn., by Edward J. Owen, now general manager of the Paden City (W. Va.) Pottery Company. A general line of semi-porcelain ware will be made at this new plant, and North Carolina clays and Tennessee coal will be used. It is expected that construction of the plant will start within the next six weeks, and as the contract for the machinery has been awarded, it is possible that the plant will be completed and ready for operation within six months.

Pottery manufacturers are facing a shortage of ware on account of being unable to work plants to full capacity. Orders are slow in getting thru the decorating shops, and buyers, therefore, have been unable to get merchandise according to original specifications. Sufficient business is now on the books of the potteries to insure full operation for months to come, even tho no further orders are received. However, new business continues to come in with every mail.

Pottery workers in the vicinity of Trenton, N. J., are anxiously awaiting the report of William Muschet, health inspector of the National Brotherhood of Operative Potters, and James McCoy, as to whether or not a fan, which will remove smoke, dust and other health destroying elements from the shops, will be pronounced as successful. The experiment is being conducted at a plant in Sebring Ohio.

While the early spring demand for flower pots was extremely good with the Louisville (Ky.) Pottery Company, this demand has slowed up somewhat and at present the concern is manufacturing crockery lines almost exclusively. Glass containers have displaced jugs to a large extent, but jars and churns are in better demand.

The Steiger Terra Cotta and Pottery Works of San Francisco, Cal., is now putting in a display of a new ornamental terra-cotta known as "Thru and Thru" terra-cotta —so named because the coloring runs thru the material instead of being merely in the glaze. The new material is expected to take the place of fancy ornamental marbles.

The shortage of workers in the western general ware potteries is more marked than ever. It is admitted that not enough skilled labor and boys are available to operate the plants to normal capacity. A number of clay shop workers have left their benches to take positions in nearby machine shops that are making war munitions.

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of August 24, 1912

of "Brick and Clay Record"......published......Semi-Monthly
at Chicago, Ill...for April 1, 1916

State of Illinois }
County of Cook } ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Frederic W. Donahoe, who, having been duly sworn according to law, deposes and says that he is the Editor of the "Brick and Clay Record," and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher Kenfield-Leach Company........................Chicago, Ill.
Editor Frederic W. Donahoe...................................Chicago, Ill.
Managing Editor..None
Business Managers, Harold H. Rosenberg and David B. Gibson, Chicago, Ill.

2. That the owners are: (Give names and addresses of individual owners or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

F. B. Cozzens........................445 Plymouth Court, Chicago, Ill.
H. H. Rosenberg..................445 Plymouth Court, Chicago, Ill.
S. J. Leach............................445 Plymouth Court, Chicago, Ill.
L. W. James..........................445 Plymouth Court, Chicago, Ill.
F. J. Sauer..............................445 Plymouth Court, Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are : (If there are none, so state.)............None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

Frederic W. Donahoe, Editor.

(Signature of editor, publisher, business manager or owner.)

Sworn to and subscribed before me this 22nd day of March, 1916.

Anna M. Phillips.

My commission expires Jan. 25th, 1920.

Case Dismissed Account Tardy Filing of Claim

The Interstate Commerce Commission has handed down its decision in the case of the Coffyville (Kan.) Vitrified Brick and Tile Company against the Missouri Pacific Railway et al.

Because of the fact that a formal complaint was not filed with the Commission until too late, the Commissioners have considered the claim for reparation to have been abandoned under the Commission's Rules of Practice and complaint was dismissed.

The complaint asked for a reparation on account of unreasonable charges alleged on thirty carloads of brick. While the claim was presented to the Commission informally on December 12, 1910, the formal complaint was not filed until April 10, 1915.

HOW DO *You* BUY COAL

In a Hit-or-Miss Fashion, or by Comparing It With a Known Standard of Excellence for Your Purposes

By Carleton H. Hubbard

In a Paper Read Before the New Jersey Clay Workers' Association.

WHEN YOU ASK a manufacturer why he doesn't pay more attention to his fuel account, you often get an answer like this: "Well, I can only use one particular kind of coal, so it is useless to spend any time or money to try to cut my fuel cost." Judging from observation of a large number of cases, this answer is given either as a reason, honestly and sincerely, or is offered as an excuse. We, however, are interested only in the man who honestly believes his situation incapable of improvement. Let's analyze his answer and see just what it really must mean. In general, it means one of two things; either (1) that coal of a certain general character, or (as it is more likely to be stated) coal from a certain locality or a certain mine, is the only one that will work satisfactorily in his plant; or (2) that he is compelled to buy his coal from a certain miner or dealer, regardless of the kind or character of the coal supplied.

The first of these situations is the one we are most interested in. I think I can say without fear of successful contradiction that such a statement is entirely due to lack of sufficient exact information in regard either to the coal being used or to other coals which might be delivered at approximately the same cost.

Let us look into the various circumstances that may bring a manufacturer into such a frame of mind that the foregoing statement may seem to him the most natural and truest thing in the world. We'll go back to the beginning.

DESIGN IN FURNACES A RECENT DEVELOPMENT

In the first place, most furnaces for the combustion of fuel, either under boilers or in kilns, weren't designed—they just grew. Only in recent years has any particular thought been applied to furnace design. There are perfectly valid common-sense reasons why there should be a difference in furnaces in which it is purposed to burn wood, coal or oil, and the principal ones are the varying quantity of volatile matter in the different classes of fuels and the varying quantity of air required to burn a pound of the given substances. Inasmuch as the average furnace in use today allows from three to five times as much air to pass thru it as is needed, and as this air supply can be controlled by a damper, which has nothing to do with the furnace proper, it is evident that we need not pursue that point further.

Now, let us drop wood and oil and confine our attention to the volatile matter in coal, omitting for the time being all other characteristics. As this is the chief factor in determining the character of coal, it has been made the basis of all classifications of coals into groups, such as the anthracite, semi-anthracite, semi-bituminous and bituminous. It is a matter of common knowledge that the volatile matter is that part of the coal which is driven off as a gas when the coal is heated, but, unfortunately, the amount of volatile which puts a coal into a certain class is by no means so clearly known.

MOST PLANT OWNERS KNOW NOTHING ABOUT COAL

Now, to come back to our manufacturer, his plant is there, and it is safe to state that his furnaces were designed in one of two ways. Either they were built like those of all similar plants in the vicinity, simply because all the other plants had such furnaces, or else they were designed by someone who is more interested in selling a particular furnace than in designing one that can burn a fuel which will be cheapest in the vicinity in which the furnace is to be used. What happens? Our manufacturer gets a good price on a high volatile bituminous coal and tries to burn it in a furnace that is better suited to a low volatile semi-bituminous. The results are bad, and he "jumps" his engineer. The engineer passes the "call-down" on to the fireman; the fireman blames the coal, and then the coal dealer hears from his customer. The coal dealer rarely knows more about the characteristics of his coal than does the customer, so the customer is treated to the usual statement that that particular coal is the best coal mined in such a county or state, and that the trouble is with the fireman. And there you have a complete circle. Our manufacturer knows that experiments are expensive, but by this time he's in the mood to change coal dealers. We'll assume that the next coal gives him trouble, and the next and the next, but that finally he hits on a coal that gives him a reduced power cost. About this time his grouch turns to a grin; his cigars taste sweeter, and the world looks rosy. And, also, about this time, he begins to say, "My plant is a very special plant, and I can use only one particular kind of coal, so it is useless to spend any time or money trying to cut my fuel cost," or this: "The only people that can give me coal that will keep me running are John Smith & Co." Do you have any idea that the man knew there was thirty-five per cent. volatile in the first coal he tried, and that the one that worked in his furnace had eighteen per cent.? And do you suppose he knows that John Smith & Co. have mines in four counties turning out coals of various characters, but all sold under one trade name? And, finally, do you suppose that some millions of years ago Nature made in one particular spot a special supply of this very special coal so that our manufacturer could keep his plant running? No, his trouble is that he hasn't reduced the characteristics of this "pet" coal of his to a definite basis for comparison. Failing in this, he also does not know, and cannot know, *what* characteristics, or combinations of characteristics, make this coal suitable. And, not knowing this, how can he conduct any kind of an intelligent search for something better or just as good but cheaper?

LACK OF INFORMATION NO SURPRISE

It is a small wonder that the manufacturer of today does not have this information. The combustion of coal in a furnace is a complex process, and the different combinations of equipment and methods of handling the equipment are almost indefinite. And there are numberless kinds of coal. The statement is made advisedly. Considering alone the inherent characteristics, that is, the sulphur, volatile, ash, the fusing point of the ash, and the heating value of the coal, you can, within certain limits, find coals with all of these factors in any proportion you may desire. Here are five variables, and each one has a considerable range of variation. In addition, there is the variation in physical condition of the coal; that is, whether it comes in the form of dust—the slack—or screened to a certain size, or what is called the "run of mine." Then there is the question of coking or non-coking.

There are few, if any, industrial uses for coal which require definite adjustment of every one of these variables. Certain definite limits of part of the characteristics already mentioned are especially required in any particular case, without, however, limiting the remaining factors. The first point, therefore, that *you must* know is just what factors are material in the selection of *your* coal, before you can change to a new coal with a reasonable expectation of getting better results than before or of getting the same results at less cost.

THREE VARIABLES IN BURNING COAL

The chief use of coal is to produce heat by its combustion. Now, in any particular process, to accomplish the best results a certain amount of heat must be generated in a certain length of time. Let us assume for the moment that this is the whole problem, disregarding the other questions, such as fumes injurious to the product, avoidance of smoke, etc. That limits us to three variables: the heating value of the fuel per pound, the amount of fuel burning at one time, and the amount of fuel burned per hour. The first is determined by our selection of fuel; the second by the area of the grates, and the third by the thickness of the fire and the amount of air supplied to it. It is obvious that if we change any one of the three, we will directly affect the result, which is a given amount of heat liberated under a boiler or in a kiln in a given space of time. This may seem rather elemental, but the point that I wish to bring out is that frequently the user tries to change one of these factors (usually the coal) without making corresponding readjustments in one or both the remaining conditions, with the result that he concludes there is only one kind of coal he can burn satisfactorily. Frequently a minor change in equipment or methods of firing will make possible the use of another coal at considerably less expense. Of course, if you have been using anthracite coal, and then change to a high-grade semi-bituminous coal without adjusting your firing methods accordingly, you are sure to raise the temperature more rapidly than before, and probably reach a higher temperature than before attained. But heat is heat, whether you get it from anthracite or bituminous, and it is simply a matter of getting the right amount of it released in a given space of time.

There are no two coal problems just alike, so it is impossible to take up the solution of any particular case in a paper of this kind, but the whole matter can be reduced to certain fundamental principles. There are many considerations besides the simple problem that I have just outlined. For example, along with your particular problem, it may be very important to avoid the fumes from sulphur in coal. In that case, we must add low sulphur to our coal characteristics. Then there is the question of clinkering, particularly if we are running a boiler plant. If the plant is crowded to capacity, we must have a high-heat coal. This will ordinarily mean a rapid rate of burning, and consequently high furnace temperatures. We now add another requirement—high fusing point of the ash to avoid clinker troubles. On the other hand, our plant may be running at a fair load, and we then have the choice of a lower grade of coal to be burned at a higher rate, which calls for a high-fusing point, or a high-heat coal which can be burned at a slower rate and with a thinner fire, and in this case we can get along with a lower fusing point. The conditions are as varied in number as are the different kinds of coal, and for that very reason the problem is not one to be attacked by guess-work methods.

PER CAPITA CONSUMPTION OF COAL RISING

The cost of coal is going up all the time. You know how rapidly our country is growing in population. Do you know that each year the per capita consumption of coal is going up, too? And since the coal supply is limited it follows that the price of coal is bound to rise. It is a fact that inferior coals are being sold alongside of good ones and at the same price, but without the use of records based on actual deliveries, the consumer is unable to select the good ones. It is sometimes possible to tell a very good coal from a very poor one by looking at it, but a variation of say twenty cents a ton in value is most certainly not visible to the naked eye. The surprise of those consumers who have used exact data as an aid in selecting their fuel is of two kinds. Pleased surprise at the values they find they can obtain without the chance of a shut-down or spoiled product, and pained surprise to think that they have clung so long as they have to the good old method of their fathers of buying heat by the ton.

The following concrete examples of the way in which records work in assisting the coal consumer may prove of interest to you.

CLAYWORKER SAVES MONEY BY CHANGING COAL

A certain manufacturer in your particular line of business had for years been using a coal, and a good coal, the name of which is a tradition in the pottery industry. It is doubtful if he knew anything definite in regard to his coal except that it was in the general class of soft coals, and that it worked satisfactorily in his kilns. It was a "pet" coal, and in unusually good standing on account of its many years of successful use.

This man decided to make use of exact records of commercial coals in investigating his fuel costs. First, he discovered the exact characteristics of the coal he was using, and then when he had this definite information he was informed that there were several good coals on the market of practically the same character. One of these was tried and was satisfactory. Now, what did he gain? He paid fifteen cents a ton less at the mines for this new coal and the freight rate on it was less by fifteen cents a ton. Thirty cents a ton on a consumption of from 4,000 to 5,000 tons! Since then this man

(*Continued on page* 1063.)

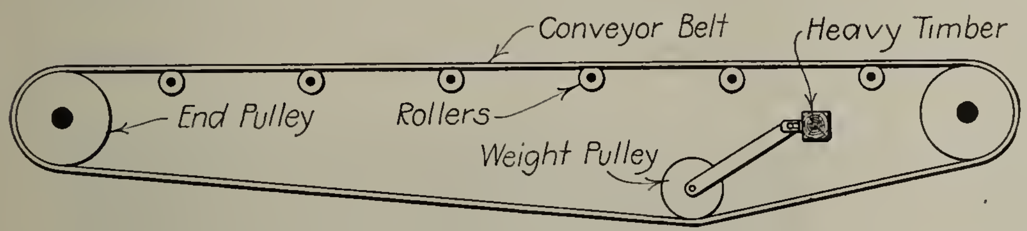
The SUPERINTENDENT

Helpful Hints for Practical Men
Whose Problem is Maximum
Production With Minimum Cost

Eliminating Conveyor Belt Troubles

Conveyor belts on many plants are the source of considerable trouble. The load that they are compelled to carry daily from one point to another makes it necessary to cut and shorten the belt at frequent intervals. If this is not done it will not fit snugly upon the pulley, but will slip or stop, allowing the clay to accumulate upon it and clog the entire system.

The accompanying sketch shows the manner in which one plant eliminated this difficulty. Between the two end pulleys and suspended so that it touches the upper side of the return stretch of the belt, is a heavy weight pulley. This is so attached to the heavy timber shown in the illustration that it can move up and down freely, its weight causing it to bear down heavily upon the return stretch resulting in all of the excess length of belt being taken up, and causing a tighter grip on the pulleys.



The construction of this device is simple and its use on the plant in question has obviated all of the annoyances and expensive difficulties above mentioned.

Personal Appearance a Matter of Safety

Rags are not safe in the vicinity of moving machinery. While the very nature of the work about a clay plant makes it advisable for a workman to wear garments that will not be harmed by repeated soiling, still this matter of dress may be carried too far by a careless workman, in fact, to a point where he is endangering his life and limbs by being negligent about the clothes which he wears.

A case is recalled where a workman lost one of his limbs, and very nearly his life, on a southern clay plant by being caught in a gear wheel on an augur machine. This man had a reputation for wearing ragged clothes at his work. He was repeatedly warned by the superintendent to wear garments that were not so ragged, but this did not seem to have any effect upon him.

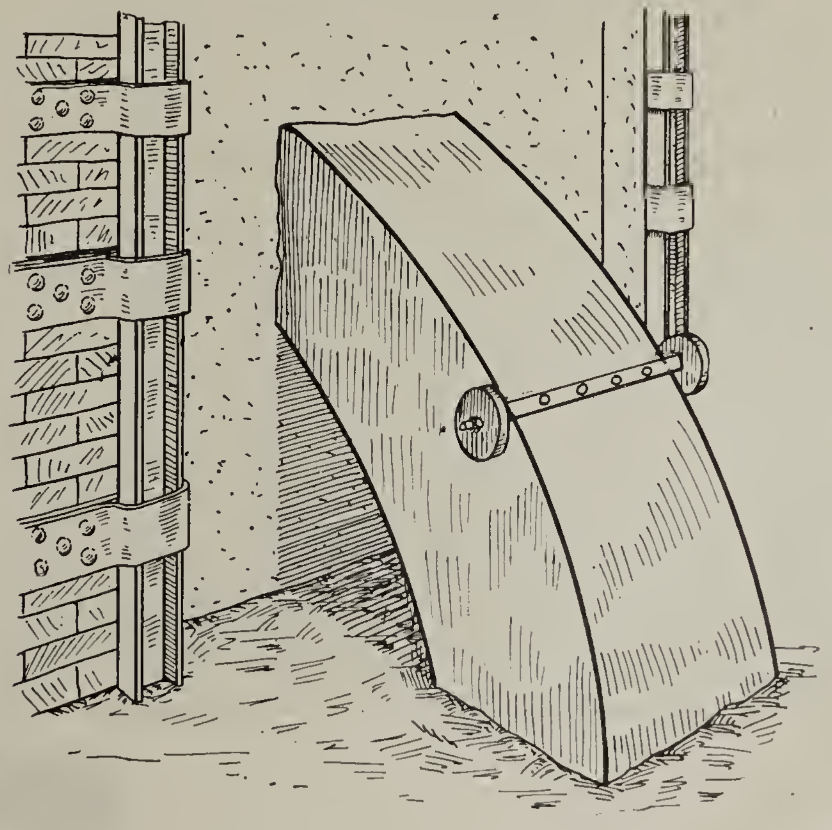
One morning the superintendent noticed that this workman appeared in a more ragged condition than usual and, accordingly, repeated his previous advice. Business at another point called the superintendent away from the plant for a few hours, and upon his return he met some of his men carrying the bleeding form of this careless workman out of the plant. He was rushed to a nearby hospital where the physician said that if good fortune had not wound some of his clothing around the limb above the wound, that nothing could have saved him from bleeding to death. His rags had nearly cost him his life.

It is a good practice for the superintendent to see to it that his men wear overalls, as is the custom on the large majority of plants. These can be purchased very cheaply, and if not worn too long a time until they, too, are dangerous, are usually a safe garment, especially for those working around moving machinery. In addition to this advantage, they can be easily cleaned by washing, thereby making a sanitary garment.

Accidents are costly occurrences, not only to the employe, but to the plant owner, and nothing should be left undone to avoid them. There will probably always be an opportunity for a workman to be fatally careless, no matter how many safety devices are installed and in spite of constant vigilance and warnings on the part of the employer. However, the matter of dress is something that every plant owner and superintendent can control, discharging the workman who persists in wearing rags, if necessary, for the good of all concerned.

Rollers Facilitate Moving of "Goosenecks"

Nearly every plant employing the waste heat system of drying uses a "gooseneck" in drawing the heat from a kiln that is cooling to the underground tunnels leading to the drier. These "goosenecks" are made of sheet metal and are usually of rather large proportions, forming, when connecting the kiln and the flue system, a quarter circle with a radius of four or five feet. It can be readily seen, and many workmen employed in clay plants using this device, know that it is hard to handle due to its cumbersome size. This, together with the fact that it is heavy, makes it a difficult task to transfer the "gooseneck" from one kiln to another. This difficulty is greatly



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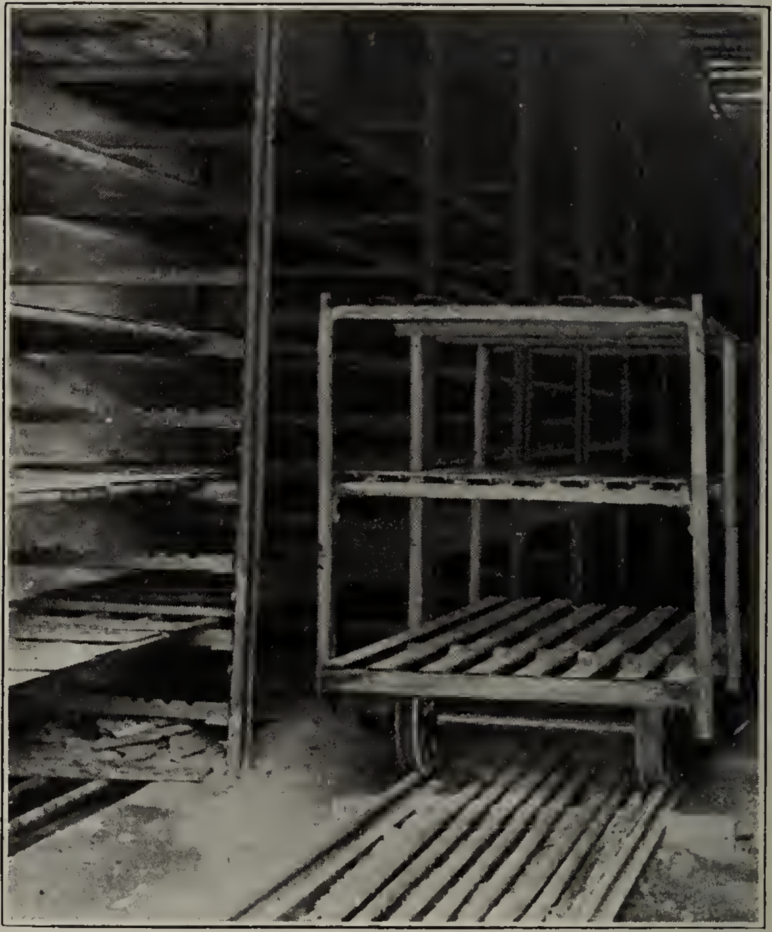
increased when it is necessary to move the device without allowing it time to cool, therefore, making it necessary to handle the "gooseneck" while it is still very hot.

To eliminate these difficulties one plant has devised the appliance shown in the accompanying illustration. A square iron rod, sufficiently long to permit of a small extension over the sides of the "gooseneck," is turned and threaded at each end, and then bolted onto the "neck." Iron discs four inches in diameter and one inch thick with a ¾-inch hole bored in the center are placed on the turned ends of the rod, and a nut screwed on the threads to keep the discs in place.

With this appliance it is a very simple matter to roll over the heaviest and hottest "gooseneck" and push it to the next kiln, or its storage place until needed again.

Emergency Creates Combination Drier

There are times on every plant when emergencies arise which demand quick thought and prompt action in order to maintain capacity or get an order out on the appointed day. Sometimes it is a breakdown of a certain machine or other equipment that puts the resourcefulness of the superintendent to test; on other occasions the receipt of an unusually large number of orders for prompt delivery may cause him to sit up nights figuring out how it can be done.



However that may be, it is the man who measures up to these situations that not only stamps himself with the mark of sterling quality, but also helps increase the balance on the right side of the ledger when the year's work is finished.

An interesting case of this kind, which occurred recently, was in connection with a drier, an interior view of which is shown in the accompanying illustration. This instance has many points of interest and value to the average superintendent and reflects the ingenuity of the man who is responsible for the combination shown herewith.

For a long time, the drier in question was one of the shelf type with long steam pipes running under the pallets to dry the brick which were set upon them. Down the middle of the drier ran an alley used in conveying the brick by a mechanical means to the drying shelves. This arrangement worked very well under the existing conditions, until a change in the character of the product created an emergency in which more drying space was needed, altho not enough to warrant the immediate construction of a new drier.

The accompanying illustration shows the manner in which the superintendent of this particular plant met the emergency. By laying tracks down the center of the drier, a space that previously was not available for drying any of the ware, he was able to convey his product to the racks by means of cars. Then, by placing a set of steam pipes between the tracks and underneath the cars of ware which he let stand in the drier, he secured a combination pipe rack and tunnel arrangement that increased the drying capacity of this plant temporarily.

Fencing in the Kiln Crown

The top of a round kiln is by no means a safe place on which to move about, even under the best of conditions. The workman (generally the burner) compelled to climb over the crown for the purpose of taking the settle or looking at the ware, or perhaps to make repairs, may be injured if his foot should slip and he is precipitated to the ground—this danger being greater if the kiln is high as is the case on many terra cotta plants.

There are means, however, of minimizing that danger and it is the duty of the superintendent of the plant to recognize and use them. One of these is the construction of a railing around the crown on top of the kiln wall. A large terra cotta plant in the East has followed this practice and points with considerable pride to these safety devices around the tops of its kilns.

The cost of building this railing is very small, little material being required. Iron pipe, one and one-half inches in diameter, forms a very suitable and economical material for the purpose, besides being easy to handle. The upright supports of the railing, as has already been mentioned, are fastened to the top of the kiln wall. To these uprights are attached the horizontal pipe, one ring of which is sufficient if the railing does not exceed three or four feet in height.

This railing not only forms a support for the workman on top of the kiln when he is changing his position, thus increasing his feeling of security, but prevents any accidents that may be the result of slipping. Especially is this true in the cold winter months when, in between burns, the crown may become covered with a coating of ice and snow. Walking upon this slippery surface is a hazardous task, but where there is a railing around the top of the kiln, should the workman slip and fall, he has an opportunity to save himself by catching hold of the railing before falling to the ground.

And when the kiln is under high heat, there is a tendency for a workman on top to become dizzy. In this case, by stepping to the flat top of the kiln wall and holding to the railing, the workman has a chance to recover his balance without disastrous results.

It is apparent, therefore, that this simple safety device has many valuable uses and may prevent many serious accidents. This, together with the small cost involved in its erection, makes it advisable for every plant owner and superintendent to give it due consideration. It is just another of the accident preventatives that are found to be excellent investments for those who take advantage of them.

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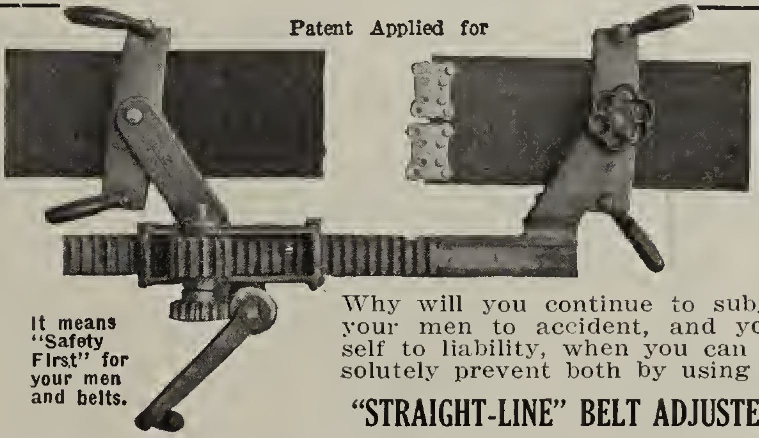

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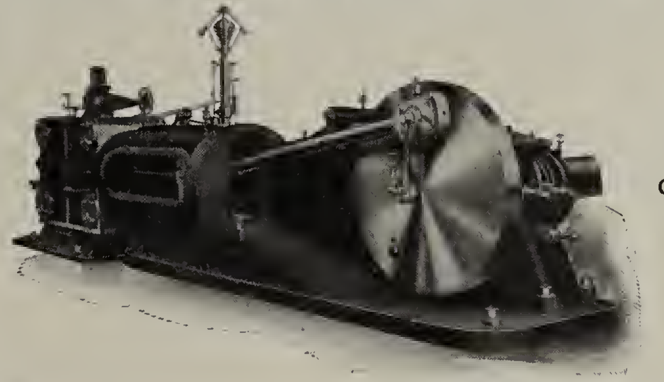

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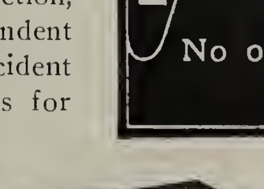

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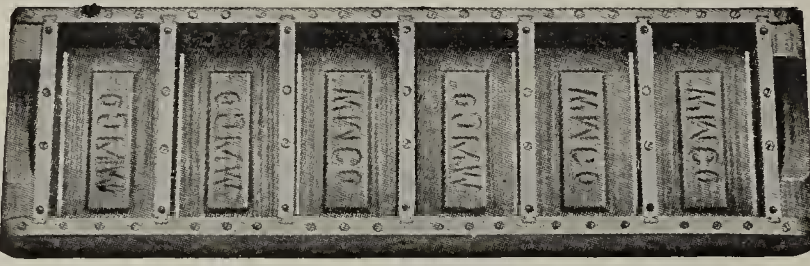

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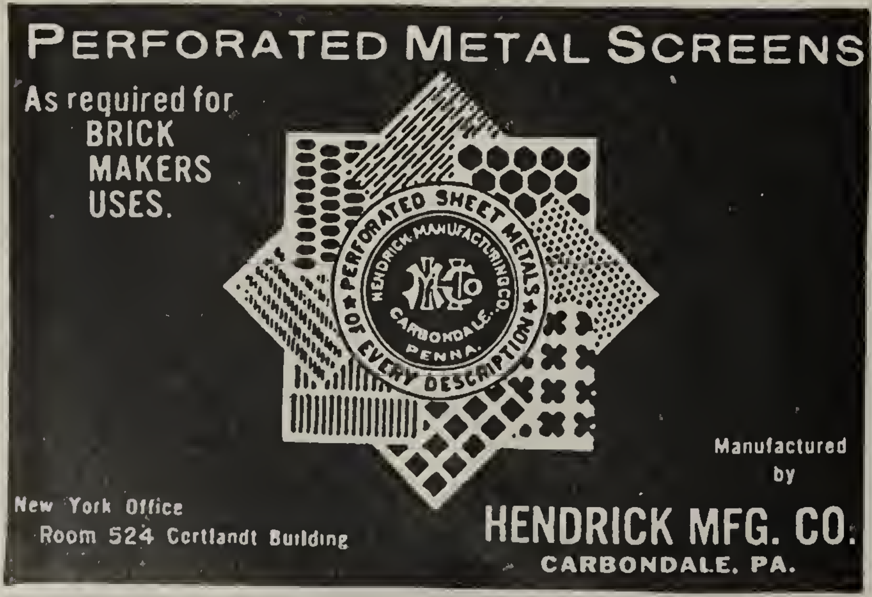

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A Problem in Burning Up-Draft Kilns

777. *Mississippi—We use open top up-draft kilns in burning our brick, but so far have no way of telling when we are ready to close them out, except just to guess by counting from the time when we think we have reached what we call a burning heat, and we generally try to run five days and nights, holding as steady heat as possible, after this burning heat is reached. Our brick do not settle at all, and we would therefore like to find some way, if possible, whereby we could determine with some degree of certainty, the stages of heat in our burning and just when to close the kiln to get certain results.*

The use of pyrometers is practically impossible in an up-draft kiln and, as there is no shrinkage, settle measurements cannot be made. This leaves but two other methods by which any accurate result might be obtained. One of these would be to so arrange the settings at certain points in the kiln, that trials can be drawn towards the end of the burn. A man may become an expert in judging when ware is finished by observing trials and very good results may be obtained in this way.

The other method would be to arrange openings in the kiln wall at certain heights above the top of the arches and at various places along the length of the kiln, thru which pyrometric cones can be observed. These cones could be set as in a down-draft kiln and boxed in by the setting so as to protect them from flame flashing.

There appears to be no reason why the latter method should not prove very successful, but it might be well to take the matter up with Professor Edward Orton, Jr., of Columbus, Ohio, who manufactures pyrometric cones and get his advice as to the best method of placing them in an up-draft kiln.

Salt Glazed Brick "Whitewash" After Exposure

780. *California—As an experiment with our clay we have tried to salt glaze a kiln of wire-cut brick and, while some of the brick took the glaze all right, yet when exposed to the air for twenty-four hours, they turned white. These same brick were jet black when first taken from the kiln. Our brick has a tendency to "whitewash" occasionally. Is there anything we can do to keep the glazed brick from turning white?*

It is our opinion that in this experiment the temperature at which the kiln was salted was too low or, if this is not the case, that an excess of salt was used. The formation of a scum so soon after the brick were exposed to the air shows that all of the salt which was put into the kiln and which was vaporized by the fires did not combine with the minerals in the clay, and consequently, as soon as the brick were exposed

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to a moist atmosphere, this excess of uncombined salts merely showed up on the surface.

Salting is seldom successful under cone four and, if this temperature was not reached when the salting took place, the entire trouble may be due to this. If cone four was reached, then the trouble is simply one of an excess amount of salt being used in the kiln. Another experiment should be made using a higher temperature and probably less salt. Only by experimenting with the clay can the proper temperature be determined, as well as the proper amount of salt to be used and the periods at which it should be put on the fire; also whether the kiln should be dampered fairly well or only about half and how to handle the dampers after the last salt has been put on. In some cases, it is necessary to draw all of the clinkers and coal from the furnaces as soon as salting has finished, or a poor result will be obtained.

This scumming of salt-glazed ware is not an uncommon occurrence. It is often seen on sewer-pipe plants and, as a general rule, will wash off with the first rain, having no permanent effect upon the glaze beneath.

Paving Brickmaker Has Trouble With Crazing

778. *New York—We are making three-inch paving-brick. The top row of the burn is always "dead" or "crazed" and, when knocked together, the brick give out a dead sound and are easily broken. We burn in twenty-six foot down-draft kilns and have ten fire-boxes. We use slanting grates. It is my opinion that we have too much grate surface. Each fire-box is twenty-one inches by thirty-six inches and there are ten of them. If we would pretend to shut out the cold air by keeping the mouth of the box full, we would then have entirely too much heat, so we are compelled to allow the fires to go dirty and not clinker oftener than about every twelve to fifteen hours in order to keep the heat back and yet keep the mouth full. We get ninety per cent. No. 1's out of a kiln and, if it were not for the top row, could beat that. Note! We are thinking of narrowing up the boxes in one kiln to sixteen inches instead of twenty-one inches, believing we could then keep the box full without getting too much heat. We use lump coal of a good grade.*

Regarding the trouble which you are having with crazed "pavers," this might happen either during the burning or during the cooling period. As a general rule, investigation has proved that in such cases the trouble usually occurs during the cooling period and not during the burning. However, from the methods of firing used on your kilns, it is quite likely it might occur in the burning period. The cold air passing over the fire between each charge of fuel would have a tendency to cause the temperature on top of the kiln to fluctuate de-

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That's what you really get when you install on your plant the

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It really costs you nothing because the reduction you get in insurance premiums will pay for the system. Then—you get the best kind of protection against fire and theft.
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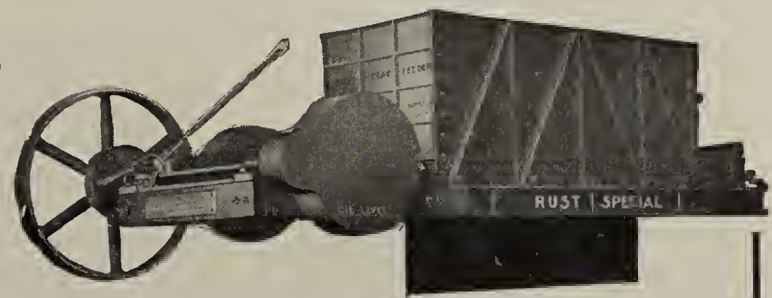

'Rust Special" Clay Feeder

It Eliminates Two Men
A Saving of Twenty-Four Dollars Per Week
It Performs Their Work—Perfectly
Ask for the "Rust" Bulletin
MARION MACHINE, FOUNDRY & SUPPLY CO.
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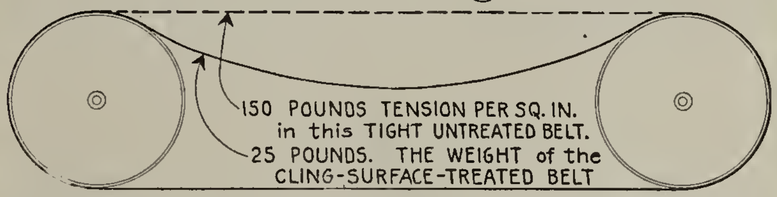
In Favor of Cling-Suface


150 POUNDS TENSION PER SQ. IN. in this TIGHT UNTREATED BELT.
25 POUNDS. THE WEIGHT of the CLING-SURFACE-TREATED BELT

Shaft centers here are 30 feet apart, belt is 6 inches wide and under Cling-Surface treatment, a 2-foot sag with over 30 per cent reduction in initial tension is practical. Cling-Surface thus gives 125 pounds per sq. in. more belt capacity to be applied to **useful** work.
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Hoop Lugs made by CALDWELL

will never slip or give way. They are the only "positive grip" lugs on the market. This lug does not depend on friction to hold it, as other lugs do.
Our catalogue of Tanks and Hoop Lugs, contains illustrations giving full details. Let us send you a copy and make you prices.
We can ship promptly.

W. E. CALDWELL CO., Inc. Louisville, Ky.
Tanks (*Steel Wood*) Towers
(*Galvanized*)
Wind Mills—Pumps—Gas Engines

cidedly and this, of course, might cause the brick on the top courses to craze during the vitrification period.

The fire-boxes on these kilns are not too large. In fact, the ratio between the floor and grate area is smaller than that followed on the best designed kilns. At this distance it would seem a mistake to make the grate area any less than it is now. However, the fire-boxes may be of such design that it is impossible to close up the mouth without putting in too great a charge of fuel at a time. In this case, it would be better to change the design of the mouth or supply doors so that the cold air could be kept out, even when light charges of fuel are put on. It would seem also that dampers are not being used on these kilns or, if they are, they are not handled properly. The rate of consumption of the fuel on the grate can be controlled by the use of the damper. Allowing the fire to become dirty and remain so for a long period, we think, is rather poor burning practice and some other method should be found to better conditions. Undoubtedly, there is a great loss of fuel in handling the fires as you do.

It is far more likely that the crazing takes place during the cooling period. Troubles of this kind generally occur as the ware is passing into the dull red state. Naturally, if the fire-boxes are left open after the firing is stopped and the vent holes in the crown are open, the top courses cool off first, receiving the shock of the cold air. The same thing happens if the kilns are connected to a waste-heat drier. At any rate, while the ware is at the bright red heat it is not damaged; the danger state is reached when the ware starts to get a dark red color. It might pay you, before changing the fire-boxes, to experiment on cooling, and when the firing is stopped, a kiln might be allowed to cool until the top courses started to get dark. The fire-boxes should then be closed by means of pieces of sheet iron or with loose brick mudded over, and the kiln allowed to remain so until the color has entirely disappeared from the top courses. During this period the vents in the crown can be left open, as this will do no harm on account of the heat of the kiln rising thru them. Of course, the stack should be cut off so that air will not be drawn down thru the crown and up thru the stack, which would cause the same trouble as if the fire-boxes were left open. It may take some experimenting to find out just when it is safe to open the fire-boxes again, so as to cool off the kiln more rapidly, but in any case, it would be wise to experiment with the cooling before doing anything with the fire-boxes. However, it would be also wise to make such changes in the front of the fire-boxes as will give more efficient results in burning.

Another Suggestion for Handling Sticky Clay

753. *Indiana—We have recently had considerable trouble with the perpendicular elevator which we have in use at our plant for elevating wet clay to the steam press, on account of it sticking to the elevator buckets. We have been using oil on these buckets, which, of course, relieves the situation considerably and works exceptionally well, but we know that we are going to get into trouble by the oil ruining the belt in a very short time. We would be glad to have you, or any of your readers, advise us what their experience has been in overcoming this difficulty—one with which nearly every clay plant has to contend at one time or another. If using oil is a good way to overcome the trouble with the wet clay, what kind of a belt could we use that would not be injured by the application of oil to the buckets?*

This question, it will be remembered, together with an answer, appeared in the April 4 issue, and later, in the April 18 issue. It will be noted that the reader who sent in this question asks that his fellow clayworkers "open up"

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Cars that are built heavy and strong—cars that will not warp—cars that will resist for years an alternation of low, wet heats and high, dry heats—cars that will stand rough handling—that only need oil to keep them moving, and bearing full loads, season after season. We have such cars and on these cars we guarantee satisfactory service, and on our Special Cars, Turntables, Grate Bars and Grey Iron Castings.

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Perfected Dry Kiln Door Carrier

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Made for doors from 2' to 8' wide and 5' to 8' high. Made for wood or fireproof construction.

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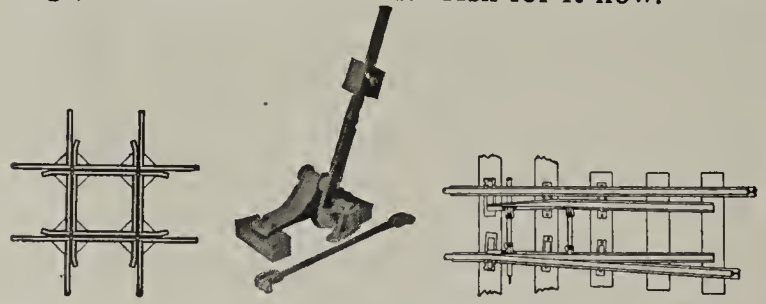
Send for Catalog C IT IS READABLE!

It pictures the best of industrial railway supplies—from the lightest to the heaviest. Switch stands, frogs, cross overs—switches. Ask for it now.



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Tycos PYROMETERS

Practical
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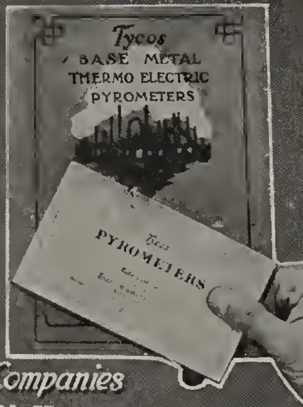
Tycos
BASE METAL THERMO ELECTRIC PYROMETERS
Tycos PYROMETERS

Ask for these Books

Taylor-Cambridge Division
Taylor Instrument Companies
ROCHESTER, N. Y.

and give him the benefit of their advice and experience. Since that time those who have read the above question, have responded loyally with suggestions, the results of which have already been published in this department. However, the end is not yet, for here comes a superintendent from the Far West who believes that our correspondent's difficulty with wet clay sticking to the elevator buckets can be eliminated if the method which he employs at his plant is followed.

In the April 4 issue we suggested that the buckets be removed from this elevator and flat plates substituted, these being bent at right angles to permit their being bolted to the belt. This method was suggested for the reason that wet clay gets jammed into the ordinary cup bucket and clings there tenaciously, while the flat plate has a tendency only to carry the clay.

Following along these lines, but adding at least one improvement to our suggestion, an Oregon clayworker writes:

"If you correspondent is using a twelve-inch belt, he should make his cups of three-sixteenths inch steel, twelve by eleven inches, bent at right angles six and one-half inches to the belt with four and one-half inches to carry the clay, as shown in the accompanying illustration. If he has some old discarded belt, he can make use of it by cutting it up into four and one-half by twelve-inch strips and fastening them to the top of the plates by drilling a hole one-half inch from the bend in the plate and passing thru a bolt. This will keep the clay from sticking to the steel. I have two elevators working on this plan and have never had any trouble."

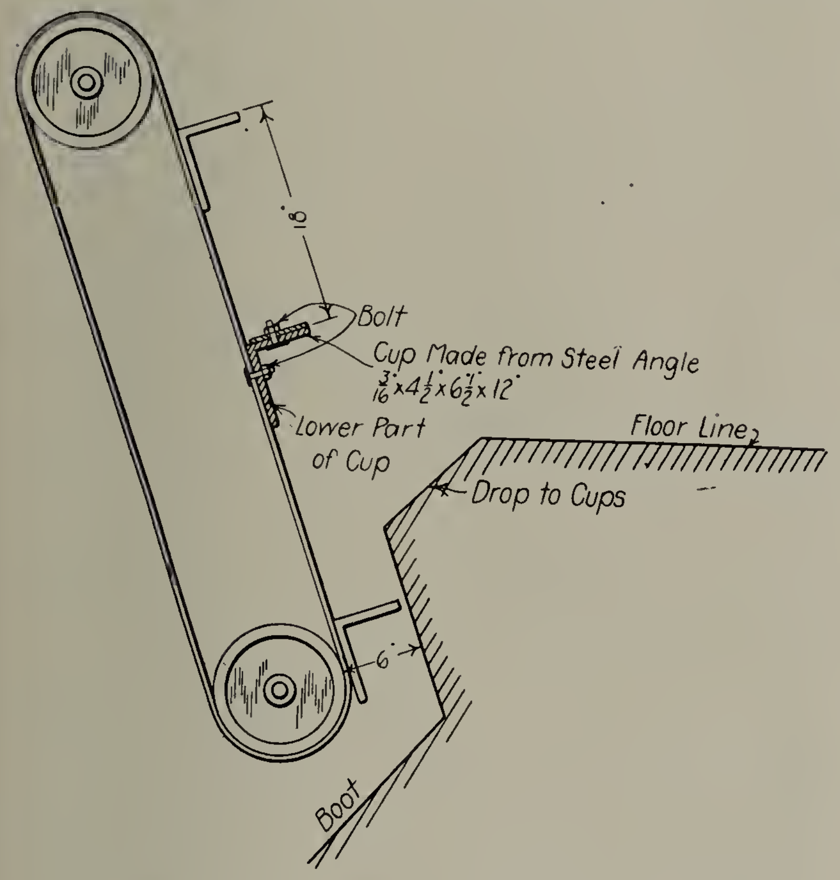

Exhibit and Ceramic Lectures a Success

Clay plants along the Raritan river in New Jersey took great interest in the ceramic exhibit given at the Perth Amboy Y. M. C. A. recently. The opening of the exhibition followed a course of lectures given by Prof. Cullen W. Parmalee of Rutgers College, New Brunswick, N. J., for those employed in the plants in that section. Another lecture course, similar to that just given will probably be announced for next fall.

Boss Ten Hour DRYER
The only tender clay dryer on the market
Boss System of BURNING BRICK
Will easily cut your present fuel bill half in two
COMMON SENSE APPLIED TO
Drying ORIGINAL Boss SYSTEM Burning
Write today for a catalog
JOHN C. BOSS COMPANY
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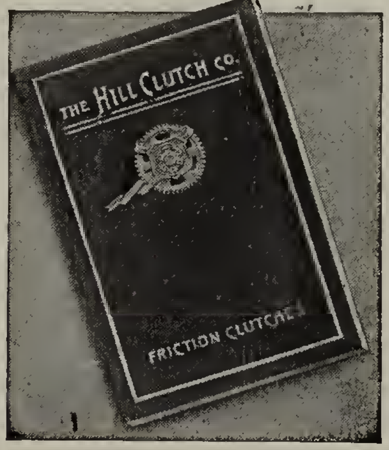

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FRICTION CLUTCHES
If your catalog file does not contain a copy of our Friction Clutch Catalog No. 8, send for one.
It contains lots of clutch data well worth knowing, besides describing the improved Smith Type Hill friction clutches.
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Investigate Our Line
Dies for Clay Working, our Specialty. Brick, Fireproofing, Plain and Ornamental Hollow Ware Dies, for Auger or Steam Press; Piano Wire Clay and Sand Screens, Conveyors, Elevators, Dry Pan and Pug Mill Automatic Clay Feeders, Friction Winding Drums.
The Louisville Machine Company
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Patentees of The Roller Process Paving Block System

See Our List of
Clayworking Books
Page 998

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When your rope breaks, your work stops; therefore, lack of durability means a loss of dollars.

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is wear-resisting at every point; consequently, its use means fewer rope changes, minimum loss of time, and greater profit.

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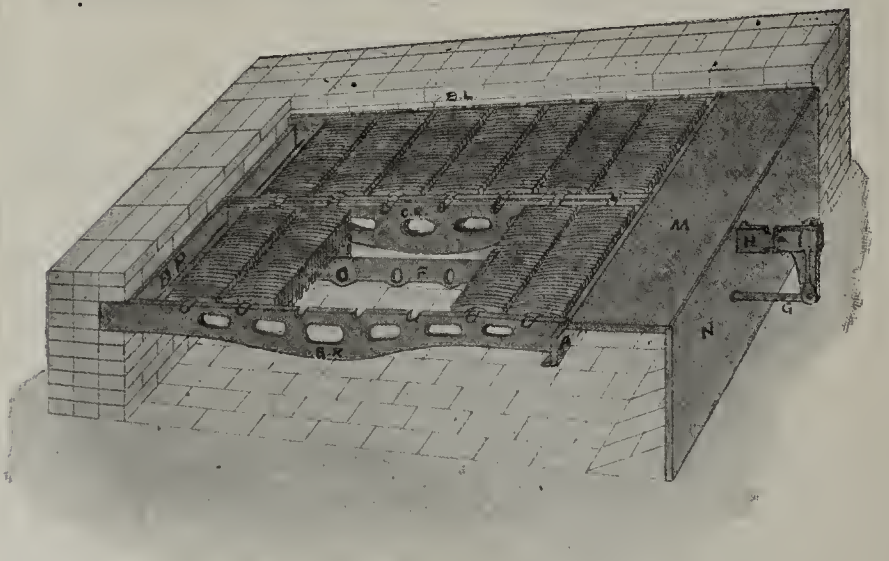
This is no mere statement—we back it up by offering to sell these grates to you on 90 days' trial.

Ask us to prove it—we take all the risk. Other brick companies rejoice now because we proved we were right. Will you?



CYCLONE GRATE BAR CO.
BUFFALO, N. Y.

The SALES-

Short Stories That May Help the Salesman Who Aspires to Salesmanagership and the Salesmanager Who Wishes to Retain His Ability to Close Big Deals

A Good Selling Point for Smooth Face-Brick

A smooth face-brick laid up with a wide, raked out mortar joint will give very nearly the same effect as a wall composed of rough-textured brick. It is only necessary for one to see these two types of brick masonry to be convinced of the striking resemblance between them, especially when brick of the same color are used in both instances.

Some salesmanagers, marketing a smooth face-brick and, therefore, having to meet the competition of rough-textures and a public craze, are taking advantage of this fact and are really making a very creditable showing with some of the work laid up with raked out joints.

A notable instance of this kind came to light recently in Washington, D. C., where a prominent architect followed the suggestions of a local brick company and specified a gray-colored, smooth face-brick for a large hospital building. When the job was completed, another architect on seeing the building, declared that it was one of the finest jobs in rough-textured brick which he had ever seen. When the salesmanager who was responsible for this job, ventured to inform the architect that he was looking at a wall laid up with smooth face-brick, he (the architect) asked the mere brick man if he was "kiddin'" him or if he thought that he has just "plumb crazy."

Like a blind man, it was necessary to lead the architect up to the wall before he would be convinced that it was not rough-textured brick that gave the building its very handsome appearance, but smooth brick with a raked out joint.

And this happened in the East where conservatism often interferes with the success of new ways of doing things, especially in the matter of building construction.

The moral of this little tale is that, because a manufacturer produces a smooth brick, he is not out of the running by a long way, even in this day and generation. Further artistic effects may be had in a wall composed of smooth brick by paneling and the various other arts and devices known to bricklaying.

No One Measured the Brick

The salesmanager of an important face-brick concern in a large city learned a costly lesson recently, and he is likely to remember the moral, which is to familiarize himself with the sizes of the brick offered by competitors.

An architect was considering the face-brick for a $250,000 school building and examined the offerings of all the local dealers, including the concern with which the manager above referred to, is connected. The latter thought that he had the best product, but he was surprised to find that he was out of line on price, a brick similar in appearance being offered at two dollars a thousand less.

His salesman argued quality as well as he could, but the other fellow came back with the same line of talk, and the

MANAGER

If These Stories Help You, Let Some of the "Bigness" That Has Made You a Successful Salesman Cause You to Write Us One Selling Letter

---

architect, apparently unable to see any difference between the two samples, finally recommended to the building committee that the lower-priced brick be selected. This was done, and the order was formally placed.

When the job was under way and the contractor began receiving the brick which had been ordered, be raised a great disturbance, as it was found that the material was smaller than the standard size product, and that it would take a great many more brick than he had figured on to complete the job. The samples had not been compared closely by anyone, not even by the salesmanager of the competing house, and therefore the discrepancy was not noticed. In all events, the contractor said that he would have preferred to take the higher-priced brick and absorb the $2 increase, as this amount would have been more than covered by the larger size.

Besides being an argument in favor of the use of uniform sizes by brick manufacturers this incident certainly brings out the advisability of examining the samples of competitors to see if their prices are based on the same cubical contents or call for the delivery of smaller brick, which, of course can be furnished at a lower price per thousand than a larger-sized product.

A Man Who Should Not Be Made An Enemy

The status of the building contractor so far as brick is concerned, especially in markets where the competition for face-brick business has become keen, is a matter of some concern, inasmuch as it is beginning to appear that he is being lost in the shuffle. If the present situation continues, the ultimate result will be that the contractor will have no interest in the sale of brick, because he is not able to make a profit on it, as he does on many other commodities that enter into the construction of a building.

To take a typical example, there was a time in a certain market when the dealers quoted a price to the owner, with a discount to the contractor. Later on competition became so keen that everyone gave the owner the "rock bottom" price. This meant that the material was billed to the contractor at the same figure. Under this method of doing business his only chance to make anything now lies either in discounting the bill—one per cent. being allowed for cash in ten days—or in finding that he needs fewer brick than he had estimated, in which case the surplus material is his. But if he is able to buy the brick specified in the contract for a sum that is less than that which he was instructed to allow, this difference must be turned over to the owner, in the large majority of cases.

The brick dealer may insist that the contractor contributes nothing to the sale, that the owner and architect are those who must be pleased, and that the contractor ought to be satisfied with his general margin on the job as a whole, without demanding a profit on the brick. But a building contractor, like most everyone else, is not in business for glory; he can't afford to handle materials without some margin, and even tho he may not pay for the brick until the owner has advanced the money to cover the purchase, he is a trade factor

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You want a reliable, economical locomotive for service about your plant. Investigate the **Baldwin gasoline locomotive.**

These locomotives are reliable, because they are correctly designed and built. They are economical, because they consume no fuel while standing idle.

Record No. 74, which is yours for the asking, tells all about them.

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WHATEVER equipment you need—don't buy until you know something about the

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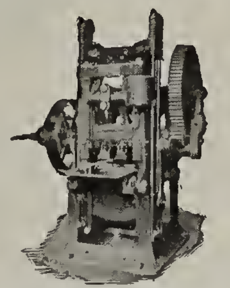
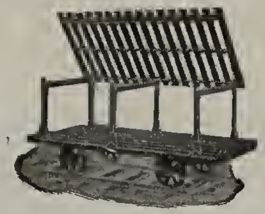


Buckets, Kiln Bands, Pressed Steel Brick Pallets, Bearings, Portable Track, Ball Bearing Turntables, Switches, Richardson Double Die Steam Represses, also Miniature Hand Represses.



Cars of all kinds

Every piece of equipment is built of the best material by the best mechanics obtainable. The Lakewood Line is Built to Last.

Ask for Catalog No. 11

Lakewood Engineering Co.
Formerly the Ohio Ceramic Eng. Co. Cleveland, Ohio

"If the Price Pyrometers had not done any more than show us how to burn each kiln to get the perfect burn at lowest cost—they would have paid for themselves many times over."

That's what the superintendent of one of the largest clay products plants of its kind said, recently when asked his advice as to the practical good of

Price Pyrometers

He said much more than this, too, and every word was praise—enthusiasm—he could not say too much. We will gladly send you his name and the names of others, and you can write direct and find out for yourself whether Price Pyrometers will pay you. We invite investigation and comparison.

We will show you how to conserve fuel—how to get a better product—the same as we have done for others.

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LEHIGH PORTLAND CEMENT CO.
LEHIGH
ALLENTOWN, PA.—CHICAGO, ILL.

Why Most Brick Streets Use Lehigh Cement

Because it is not only high in strength but dependably uniform.

A perfect vitrified paving block of your manufacture used with a perfect cement filler of Lehigh Cement makes a permanent street for the city and a permanent highway for the country.

These are only a few reasons why more brick streets use Lehigh Cement than all others combined.

You Cannot Afford to Take Any Risk

Lehigh Cement is the perfect cement. Specify it always. It protects you. Set the proportions for the mixture. Adhere to them. Then your job will be uniform throughout.

LEHIGH
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of sufficient importance to warrant being given consideration.

Certainly, if the contractor can make a profit on a subtitute for brick, and must handle the latter without a margin, his interest naturally is in the direction of the substitute, and this is one feature of the situation which ought to be given considerable thought. Incidentally, the best place to discuss this problem would be in a brick dealers' local club. Exchanging ideas on this topic would probably lead to an agreement of opinion and the elimination of any difficulty which might have been involved.

Tell the Trade Your Telephone Number

So much business is transacted over the telephone nowadays that there is considerable advantage to be gained in giving publicity to the numbers which designate your company on the switchboard.

The number is the property of the telephone company, as is announced in every directory, but ordinarily the concern that has made use of a number for a considerable period need have no fear of losing it, as the company will respect the good will which has become attached to the number.

A well-known brick dealer, who is compelled, on account of the presence of two telephone systems, to have two numbers, took care to arrange for the use of the same number in both books. Thus on the Bell line the number is Main 1100, and on the independent system it is City 1100. He advertises this number on his stationery, on the window, in the newspapers and elsewhere. "Call Eleven Hundred When You Want Brick" is a suggestion which a lot of buyers remember when they are in the market.

Speaking of the telephone emphasizes the necessity of seeing to it that the phones are answered by those who have been trained to be courteous, obliging and cheerful. A lot of houses let the office-boy answer the phone, apparently not considering this sort of inquiry important, but as a matter of fact it is one of the important factors in business building. Poor handling of telephone calls will undermine the trade of any concern. Make a point of having someone who is inteligent, who understands the business and who has a pleasing personality in his voice, take care of all calls. It will help your business.

Keep Regular Office Hours

From the very nature of his business the brick salesman is required to be on the street a good part of the time. In his case it is better, as the life insurance agent said, to wear out sole leather rather than to put a shine on that portion of his trousers where he reaches for his pocket handerchief. But there is a big advantage in having it generally understood that he will be at the office or display room at certain hours of the day for the purpose of explaining his line and giving details concerning the brick which may be on exhibition.

The most convenient time for the average person, either architect or owner, is probably around the lunch-hour, say from twelve to two o'clock in the afternoon. A great many people seldom leave their offices or place of business except to go to lunch, and at that time they take care of other outside appointments. If they are interested in building materials, they will be glad to look over a display if the man in charge can show it properly at that time.

Of course, many companies have some one available at all times to talk to prospective customers who may call at the display room, but in the average concern, not of large proportions, one man usually devotes his attention to the selling end, and he is best qualified to talk to visitors, explain differences in quality and to quote prices. For this reason it means a loss of effectiveness not to have him meet the prospect and talk brick. Incidentally, the visitor is liable to lose interest if he finds that the high quality which he had expected to find in the display is not made clear and is pointed out by a competent salesman.

It would be a comparatively simple matter to advise architects that the salesmanager or party in charge of the selling end, would be on hand at the display room from twelve to two, and that any who desired to learn something concerning the company's lines would get the best service if they made their calls at that time.

The Semi-Monthly Trade Review

THE TREMENDOUS ACTIVITY that has characterized building operations during much of this year, suffered a slight set-back since last this review made its appearance. Labor troubles and increased prices chiefly, and in many localities inclement weather, have conspired to lessen the upward trend of construction that marked the early part of the present year.

However, this condition, in many cases, is only local and temporary, and affords a welcome relief to manufacturers of burned clay building materials, enabling them to catch up with the demand.

The number of building permits being taken out all over the country is encouraging, substantial gains being reported over the same period last year and in 1914, but as a whole, conditions are quieter at many points, so far as actual operations are concerned, when compared to the unusual activity of previous months.

GOTHAM BRICK BREAK PRECEDENT IN PRICE RAISE

A very interesting condition prevails in New York and other eastern cities. There, operations are progressing at a good rate, a strong demand for building materials being noticeable. An unusual occurrence has taken place in the Gotham brick market—a rise in price from $7.75 to $8.00 and, in many instances $8.25 per thousand, having gone into effect within the past three weeks. This is the first time in many years that a rise in price has been known to occur in the brick market at this time of the year, the tendency being for values to decrease, due to the heavy shipments being made.

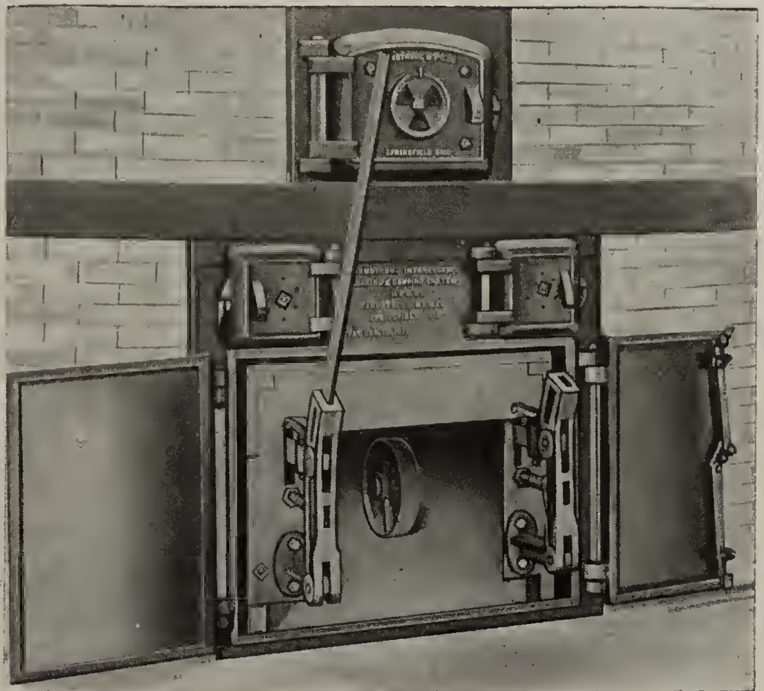
A practical diagnosis of the situation, however, reveals a very good reason for the increased selling price. Labor difficulties, primarily, are being pointed out as a direct cause, since a shortage of men in the Hudson and Raritan river districts has made it impossible to ac-

WILL YOU ACCEPT THIS OFFER?

We will ship you, no matter where your brick plant is located, our

STANDARD INTERLOCKING KILN GRATE

We will install it at our expense—let you give it a thoro trial—and if it does not do all we claim for it in your opinion, we will remove it without one cent of cost to you. We know what our grate will do—all we ask is a chance to show you.
Write for details and prices.



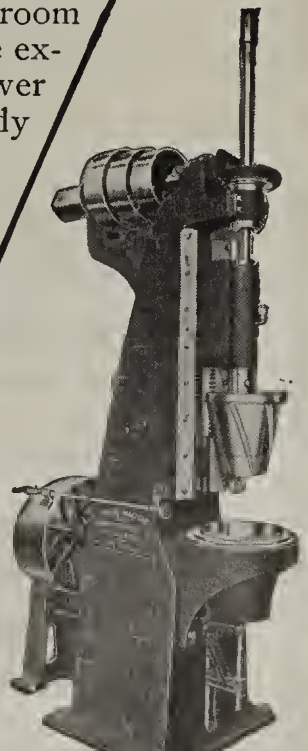
The Armstrong Manufacturing Co., Springfield, Ohio

A bi-product that is profitable

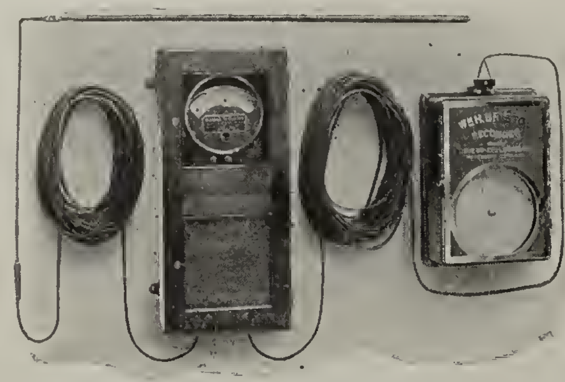
Place the machine off in one corner of your plant, and let it absorb the spare time of your machine room men. They soon become expert, and a stock of flower pots quickly collects, ready for the kiln.

It is almost pure velvet—a bi-product—a sure seller with a manufacturing cost low enough to insure a goodly profit.

Send us sample of your clay and let us show you what our flower pot machine will do.

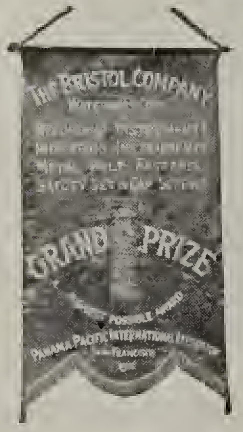


Baird Machine & Mfg. Co.
54-56 Jefferson Ave.
Detroit, Mich.



Bristol's Pyrometer Installation

For many practical applications of electric pyrometers it is desirable to have the furnace temperature indicated at the furnace operator's post of duty, and a recorder installed in the office of the superintendent. This combination indicating and recording unit of Bristol Pyrometers, as shown above provides for both these requirements. Highly recommended for brick kilns.



Write for Bulletin 205

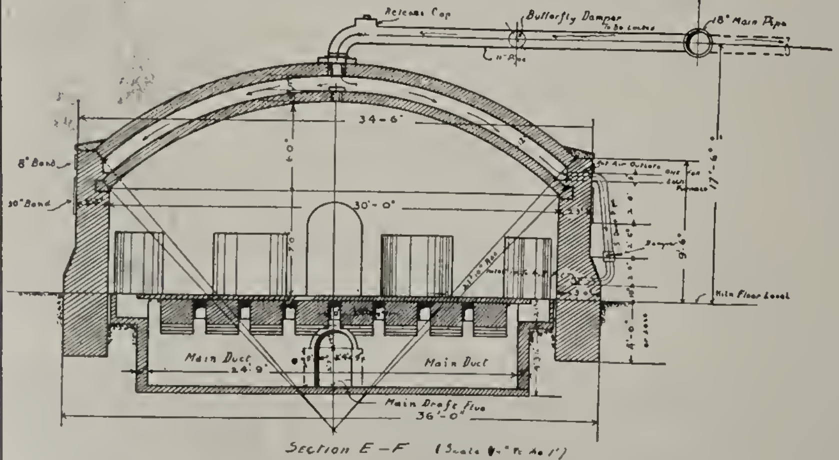
THE BRISTOL CO.
WATERBURY, CONN.

BRANCH OFFICES
BOSTON NEW YORK CHICAGO
PITTSBURGH SAN FRANCISCO

We Don't Disturb Your Present Kilns

THE McManigal Super-Heating System can be applied to the kilns you already have—that's one advantage. ¶Yet there are many other good reasons why you should adopt the McManigal System—it protects the fire brick crown from outside cold—it collects and utilizes the enormous amount of radiated heat—there is perfect control of fires with a big saving in fuel and time.

¶Let us send you information and figures showing what we are doing for others.



Patented

The McManigal Grateless Furnace Company
LOGAN - - - - OHIO

cumulate large stocks that are usually found on the yards at this time of the year. A very wet season and labor troubles on the Hudson last year also have contributed to cut down the available supply of brick.

A recent count taken of the brick now available in the Hudson River district showed that only 350,000 were on hand, as compared with a normal available stock at this time of the year of ten million. Since this condition is practically the same in both the Hudson and Raritan river districts, little relief is to be found and, therefore, prices have remained firm at the new and higher level.

LABOR SHORTAGE HINDERS NEW ENGLAND BUILDING

A good demand for clay products is reported from the New England states, the cities of Boston and Springfield, Mass., enjoying a better business than last year. However, many important building operations are being held back at these points because of a shortage of labor.

In the Middle Atlantic states is found a most encouraging situation. The demand is in excess of the supply and building permits are running close to record breaking figures, especially in Philadelphia. Artificial restrictions seem to hinder operations somewhat in Pittsburgh, Pa., the eastern center of the face-brick industry. The condition reported at this metropolis is that manufacturing costs have been greatly increased, due to the heavy requirements of the steel and munition plants for men. In order to meet this shortage in workmen, large quantities of labor-saving machinery have been installed which, while making the brick manufacturer more independent of labor and giving him a larger output, has been purchased at a time when the cost of machinery is much above normal. As a consequence, there is a bigger overhead to be carried by the companies operating in this district than when labor was plentiful.

FROM KILN TO CARS THE RULE AT YORK

Two cities of Pennsylvania stand in marked contrast as regards activity in building. While the majority of operations in Albany, Pa., are being held in abeyance by the high cost of materials and by labor disputes, yet a report from York, in the same state, is exceedingly optimistic when viewed from the brickmakers' standpoint. Seldom have building operations been characterized by such activity in this city as is now the case, and the predominant material is brick. In this immediate vicinity more than a million brick are manufactured each week, but at the present time they are not even piled upon the yards, but are loaded or hauled directly from the kilns. It is thought from present indications that the consumption of brick at that point this year will be far in excess of any previous record.

The difficulty in making deliveries is causing some annoyance in building at Jacksonville, Fla., but conditions have improved somewhat during the past two weeks. A substantial price is being obtained for all building materials in this southern city. While business conditions at Washington, D. C., are nothing to boast of, building is showing a marked improvement.

DETROIT AND CLEVELAND A BUSY PAIR

Builders have been kept exceedingly busy in the cities of Cleveland and Detroit. While the tidal wave of activity struck the "Sixth City," immediately following the "Complete Building Show," the effects of this most successful undertaking are still being felt and, besides, contracts let in February are now being carried out and are calling for materials. In Detroit the mighty rush of building, felt at the first signs of spring, shows little abatement. Brickmakers have gained some relief from the heavy shipments of commons from other cities. In Dayton, Ohio, building permits are heavy and the demand for materials is good, with prices satisfactory.

Altho building permits issued in Chicago during the last week in May totaled somewhat over a million dollars less than those issued the previous week, yet a margin of almost that amount prevails when compared to the same period last year. Real estate sales are a feature that forecast an increase in building operations, being decidedly better than those of the previous week, and about a half million dollars in advance of the figures for the corresponding period of last year.

NORTHWEST PLANTS UNUSUALLY ACTIVE

The restrictive clutches of Winter in the Northwest have long since loosed their grip and Duluth, Minneapolis and St. Paul, Minn., are now experiencing a regular spring "boom." Common and face-brick plants serving these cities are finding a ready market for all the brick they can manufacture. Drain-tile and sewer-pipe manufacturers are also having a very prosperous season. Clay block segmental sewers are finding great favor in this vicinity and many of them are being laid.

CALIFORNIA BUILDING LOOKING UP

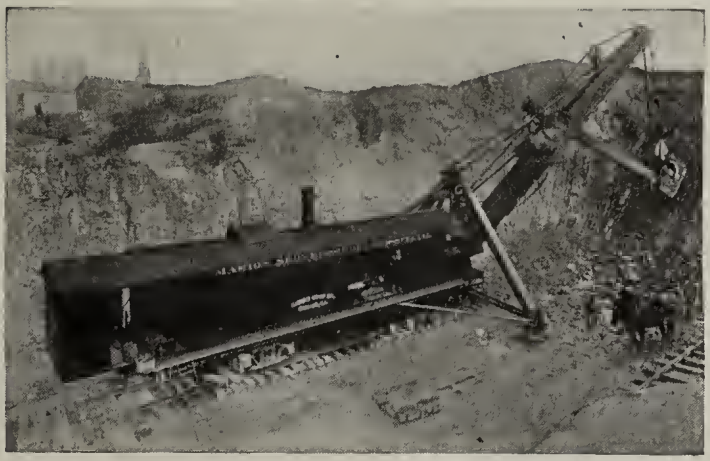
The building situation on the Pacific Coast continues to improve; the interior cities and towns of California are doing their share to swell the total of new building by putting up civic and educational structures and there is an encouraging revival of industrial and factory construction. Clay products are coming to the front strong in this upward movement, the outlook for brick and terra cotta being exceptionally bright. The increased cost of steel products is holding back some building operations, of course, but the amount of new work that is being projected is surprisingly large. The main reason for this healthy condition is the fact that, for the past few years, building has been inactive so that urgent need now compels renewed vigor in this line. The price of common-brick at San Francisco remains firm at $9.00 per thousand which means a price of $7.50 at the yards. Face-brick is moving fairly well with a number of new types winning their way to popularity.

PACIFIC COAST TERRA COTTA DEMAND IMPROVING

Terra cotta manufacturers on the Coast report a better business than for some months, and it is interesting to note that the very highest grades of this material are meeting with the strongest demand. Polychrome effects and terra cotta having a solid body of color running all thru it are being specified by architects whenever possible. Terra cotta is slowly but surely extending to a much wider market than heretofore, schools and commercial structures being freely ornamented with it.

SEWER-PIPE TAKES SPURT ON THE COAST

The sewer-pipe business on the Coast has shown a marked improvement in the past month, a number of new localities having announced plans for the installation of much needed sanitary improvements. The difficulty has been to raise the money for these projects since the bonded indebtedness of the majority of the municipalities is dangerously large. Wherever this work is undertaken, however, vitrified clay sewer-pipe is holding its own against competitive materials. The Coast manufacturers are careful to maintain the high standard of their pipe which is giving it a prestige and the manufacturers an enviable reputation.



YOU can't raise steam from cold water—you've got to heat it first. You can't make good bricks from clay as it runs in the bank—you've got to get it *thoroughly mixed.*

A Shovel that digs without mixing, leaves part of its work undone. One of the things that owners appreciate so greatly about our Shovels is the fact that

"Marions" Mix the Clay as They Dig

—making your work in the grinding room much more simple, and producing a more uniform run of brick. "Marions" also enable you to handle very hard material without blasting.

Particulars? Our special Brick-Makers' Catalog A120 is full of them—get *yours*, without obligation, by writing today.

Marion

We Make Excavating Machinery of Every Description

Branches:
Atlanta, Chicago, New York, San Francisco, Seattle

THE MARION STEAM SHOVEL COMPANY

Established 1884 MARION, OHIO

120

But—You Can't Do It!

You can't get the kilns unloaded on time—You can't prevent accumulated demurrage on cars—You can't have satisfied hustling wheelers—

UNLESS

You have a fleet of INVINCIBLES

Look!

IT IS BALANCED

The axle is under the load—NOT at one end of it. It slides—down the runway—and the hind legs don't rip and tear.

It Rides Its Load

THE TORONTO FOUNDRY AND MACHINE CO.
TORONTO, OHIO

There is a man—

a manufacturer of fireclay products; he has used Canton Kiln Grates for four years.

This man saved 30% of his burning costs each year in the first three years.

Today, in the fourth year, he claims and is accomplishing a saving of—40%.

Are you neglecting an opportunity? In all fairness to yourself, to your trust, to your company—is it right for you to any longer neglect an investigation of Canton Kiln Grates?

We have dozens of sets in kilns. We will furnish you a set on a trial basis.

Write that letter to us—now.

The Canton Grate Co.
1706 Woodland Ave.
CANTON OHIO

In any part of your plant, regardless of dust or dampness, you will get utmost satisfaction out of

Hettrick Canvas Belting

Used daily in scores of brick plants for transmission, elevating and conveying.

Hettrick belting is red stitched canvas—the kind that sticks—lasts—and does not slip.

Try it—you too will say with others that Hettrick Belting Beats Them All.

Hettrick Bros. Co.
Toledo, Ohio

IN *the* WAKE *of the* NEWS

Being Brief Mention of a Host of Interesting Happenings in the Varied Fields of Clayworking

PERSONAL

Albert H. Eaton has been appointed assistant superintendent of the several yards of the New England Brick Company, Boston, Mass.

G. C. Hidecker of the Ione Fire Brick Company, San Francisco, Cal., is at Panama on business in connection with his interests in the Canal Zone.

William T. Walker, president of the Walker and Frank Brick Company, Detroit, recently celebrated his seventieth birthday. Mr. Walker still enjoys splendid health.

Thomas W. Murray has assumed the position of salesmanager of the United Fuel and Supply Company, Detroit. Harry A. Walters continues in charge of the face-brick department.

Bert J. Graham, vice-president and general manager of the Denison Interlocking Tile Corporation, Cleveland, Ohio, is now on a four weeks' business trip in the West.

Frank Moore, for many years superintendent of the Silica Brick Works of Mt. Union, Pa., has resigned that position owing to ill health. Mr. Peterson of Alexandria, Pa., is his successor.

Mayor Harry L. Davis of Cleveland, Ohio, is going to build a new home and, as might be expected, it will be of brick. The house will be a two-story structure and will cost about $7,000.

Henry Dreischmeyer, Sr., who is reputed to have established the first brick plant in California, died during the past month at the age of seventy-six, at his home in San Jose, Cal. He leaves a widow and four sons.

William Conway, a veteran brick manufacturer of Philadelphia, is rapidly recovering from an attack of paralysis, every indication pointing to a complete recovery. Mr. Conway is known as an energetic business man and has many friends who anxiously await his return to health.

Frank Price, who has been in charge of the Cleveland (Ohio) branch of the Claycraft Brick Company of Columbus, has returned to the last mentioned city where he will join the sales force. An agency arrangement has been made for the Cleveland territory.

W. W. Childs of Oakland, Cal., for thirty years manager of the Remillard Brick Company of that city, one of the largest manufacturers of brick in California, died at his home in Oakland recently. He leaves a widow and three sons.

F. B. Peck has resigned as secretary of the Ottawa (Kan.) Brick and Tile Company, being succeeded by Jean E. Nelson of that city. Mr. Peck and his wife have arranged for an extended visit in the West during the coming year.

George P. Wilson, for the past three years secretary and treasurer of the Devonshire Brick Company of Dillonvale, Ohio, has severed his connections with that company to accept a position with the Building Materials Company of Steubenville, Ohio.

Joseph E. Widener, a member of the board of directors of the Jarden Brick Company, Philadelphia, Pa., and a well-known local financier, recently purchased another of the famous Mazarin tapestries for which he is reported to have paid $200,000. This latest addition to his already wonderful collection is by Van Orley, and is called "The Crucifixion."

John P. Labahn, former president of the Illinois Brick Company, died on May 23 at 622 Gary place, Chicago. Mr. Labahn was born in Germany and came to this country when he was eighteen years old. He was engaged in the manufacture of brick until four years ago when he retired from active business.

The Cleveland (Ohio) office of the Hydraulic-Press Brick Company announces the resignation of J. M. Bevill who has been connected with that office for the past three years. Mr. Bevill has accepted a position in the brick department of the United Fuel and Supply Company at Detroit, Mich.

Charles F. Quaintance, secretary of the Herold Pottery and China Company of Golden, Utah, returned recently to his office at Golden after a four-months business trip in the East. From the encouragement received on the trip by the users of the Herold product, Mr. Quaintance predicts continued prosperity for the Golden plant.

James M. Mack, president of the Mack Manufacturing Company and a director of the Hamburg (Pa.) Vitrified Brick Company, died at his home in Philadelphia recently, following a brief illness. Mr. Mack was very well liked in the industry, both he and his late brother, John M. Mack, having been two of the most prominent brick manufacturers in the state of Pennsylvania.

Cyrus Borgner, president of the Cyrus Borgner Company, manufacturers of fire-brick at Philadelphia, was recently re-elected vice-president of the Manufacturers' Club. This organization is a representative body of leading Philadelphia manufacturers and merchants, and the re-election of Mr. Brogner to the office of vice-president is considered an honor by the brickmakers of that city.

Hinkle M. Guy, manager of the Capital City Vitrified Brick and Paving Company of Topeka, Kan., recently addressed the Rotary club of that city on the subect of clayworking and its development since the days of the Israelites, together with the improvement of brick plants. Mr. Guy also showed that in the twenty-seven years of operation his company has manufactured more than 200,000,000 brick.

Bernard Suer, Sr., at the head of B. Suer and Sons, brick manufacturers, died on May 28 at his home in Cincinnati at the age of sixty years. This company is one of the large producers of brick in this vicinity and had been managed by Mr. Suer for several years. His sons were in the business with him, and will continue to operate the plant. Mr. Suer is survived by ten children, five boys and five girls. He was prominent in business and fraternal circles.

A. P. MacDonald, salesmanager for the P. Bannon Pipe Company of Louisville, Ky., represented the company on the recent "booster" trip of the Louisville Board of Trade into Tennessee. The party left Louisville on Monday evening, May 22, for a four-day tour of the principal cities of Tennessee to "boost" Louisville products. These excursions were annual affairs with the old Louisville Commercial Club which was merged with the Louisville Board of Trade a few months ago, and will be continued by that organization.

The Tucson (Ariz.) Pressed Brick Company has ar-

The problem of maintaining tight valves is most effectively solved -- when you equip with --

Jenkins Bros. Valves

Considering the service, they are more economical and far superior to the common metal seat types. Jenkins Bros. Valves have no metal-against-metal contact of seat; instead, there is the combination of brass raised seat and Jenkins renewable composition disc. The labor of regrinding is obviated. When repair is necessary, simply insert a new disc at expense of a few cents, and you have practically a new valve. Any dealer can supply. All genuine have diamond trade mark, as shown in the cut.

Jenkins Bros.

80 White Street. New York. 524 Atlantic Avenue. Boston.
133 N. 7th Street. Philadelphia. 300 W Lake Street. Chicago.
Jenkins Bros. Limited. Montreal. Canada. and London E. C. England.

Dewey 5-Ton Locomotive

This is because the Dewey is a chain-gear locomotive, which gives great tractive power and yet keeps down the weight.
The Dewey is so simple that any man on your plant can run it—it's the ideal locomotive for the clay plant.

DEWEY BROS., Goldsboro, N. C.
"Let the Dewey do your work"

One Price $1500

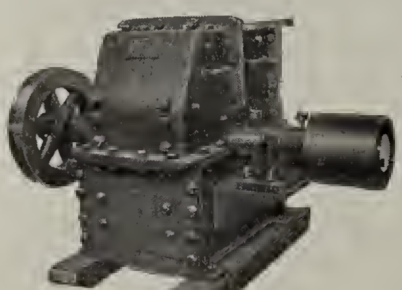
The Same Work with Less Power
The ALL-STEEL No. 1

K-B PULVERIZER

Consumes only 10-15 h.p. to reduce 4-7 tons of stone, or 8-13 tons of clay per hour from 3″ to dust. Larger machines have the same high efficiency.

It is built entirely of steel and lined throughout with manganese hardened steel plates. It will endure the hardest service.

The hammers are adjustable to compensate for wear and to keep the product uniform.



Easy access is afforded to the inside of the pulverizer, as the screens slide out of the lower casing like drawers.

Write today for full details to the

K-B PULVERIZER CO.,
Inc.
86 Worth Street
New York City

HOOK'S
Latest Patented System
For Burning Your Clay Products
Means Success for You

Scores of Brick and Tile Manufacturers in the UNITED STATES and CANADA are burning their ware successfully with HOOK'S LATEST IMPROVED UP and DOWN DRAFT KILN.

In one section of OHIO, where Hook's Latest Patented Kiln is best known, one of our Representatives took orders for over 20 kilns in 3 days. This ought to be convincing evidence. Do not be deceived—insist on having HOOK'S Latest Patented Kiln.

SOLD ONLY BY

Ohio Kiln Company
Vigo, Ohio

ranged to manufacture 85,000 specially designed brick for the new city hall to be built at that point. Special machinery, installed recently, will be used for the first time in manufacturing this brick, which are to receive the additional distinction of being the first burned in the new round down-draft kiln just completed at this plant.

CALIFORNIA

W. R. Simons, president of the Simons Brick Company of Los Angeles, Cal., has been elected second vice-president of the Los Angeles Builders' Exchange.

O. G. Crossfield, president of the Pureclay Brick and Tile Company, San Francisco, states that an option has been given on the plant of the company and that a sale is expected very soon.

Among the California towns that are now calling for bids on sewer-pipe are: Vallejo, Bakersfield, Salinas, Petaluma, Sacramento, Stockton, Auburn and Eureka. Several of these towns have already let some contracts this year.

The Refractory Magnesite Company, San Francisco, Cal., is shipping its products all over the country to steel companies, some as far east as Pittsburgh. The entire present output of the plant at Preston, Cal., is contracted for by large buyers.

C. G. Berg, president and manager of the Port Costa (Cal.) Brick Works, has received the order for the common-brick to be used in the two new wings of the county hospital at San Francisco. Three and a half million of brick are required for this job.

The Richmond Pressed Brick Company, represented in San Francisco, Cal., by the United Materials Company, has closed a contract with the Standard Oil Company for brick to be used in the new oil refinery at Richmond, Cal. Deliveries are now being made.

W. W. Dennis, manager of the McNear Brick Agency, San Francisco, Cal., reports steady work on a number of large orders both in and out of San Francisco. The Ione Brick Company, represented at that point by the McNear Brick Agency, is sold up for several months ahead.

The project of a clayworking plant to be built at Modesto, Cal., has been revived and a company is to be formed under the name of the Union Brick and Tile Company. William Anderson, an experienced brick manufacturer, is at the head of the project. Tests are being made of the clay and should they prove satisfactory, the plant may be built and put in operation this summer.

The San Bernardino (Cal.) Brick Company has purchased the W. D. Gamble brick plant at San Bernardino and in the future the two plants will be operated under the name of the purchasing company. P. O. Duclos, manager of the San Bernardino Brick Co., will be the manager of the new combine, and W. D. Gamble will be the general foreman. New machinery is to be installed at both plants.

The Coleman Brick and Lime Company, recently incorporated at Santa Barbara, Cal., has secured permission from the Corporation Commissioner of California to issue 8,333⅓ shares each to W. R. Coleman and O. D. Miller, and 4,166⅔ shares each to D. O. Kelly and Magnus Johnson, in exchange for a brick and lime business at Santa Barbara, to be taken over by the new company.

Brick and sewer-pipe makers will be asked to compete with concrete in bidding on the new sewer system at Fresno, Cal. A half-million dollars in bonds was voted for the new system during the early part of the present month. For pipe ranging above thirty inches, alternate bids will be received for brick and concrete; and for pipe ranging thirty inches and less, alternate bids for vitrified clay sewer-pipe and for concrete pipe will be asked for.

The plant of the Pacific Tile and Terra Cotta Company at Tropico, Cal., which has been operated for several years by the Independent Sewer Pipe Company of Los Angeles, Cal., has now been taken over by the Pacific Tile and Terra Cotta Company and operations are to be resumed under the former management. At present, the output is almost exclusively sewer-pipe, but the company is planning to add other lines in the near future.

Mr. Hoyt, manager of the United Materials Company, San Francisco, Cal., is preparing to deliver a quarter of a million rough-textured face-brick manufactured by the Los Angeles Pressed Brick Company, to the Overland Garage building in San Francisco, and three-quarters of a million common-brick on the same job. S. W. Smith, treasurer of the United Materials Company, has not been actively connected with the management of the company for some time on account of poor health. He now lives at Elsinor Hot Springs.

San Francisco terra cotta plants are busy, and the outlook for the summer and fall is the best in several years. All three of the large manufacturers at this point are well sold up and are working to capacity. Gladding, McBean and Company has secured a large order for the terra cotta to be used in the J. K. Armsby Company's new building to be erected at the corner of California and Davis streets, and is shipping out large quantities of terra cotta as far north as Portland, Ore., and as far south as Bisbee, Ariz.

Building operations in San Francisco, Cal., this spring are more active than for several years past and, as the greater part of the new construction is inside of the fire limits, the demand for fireproof materials is very good. The total value of the building permits issued during April was just a little short of two and a quarter million dollars, a gain of fifty per cent. over the same month of last year. Of the total amount brick and concrete claim about $900,000. The official figures do not segregate the brick from the concrete buildings, but local brickmakers say that the slow deliveries and high prices of reinforcing steel are favoring brick and terra cotta.

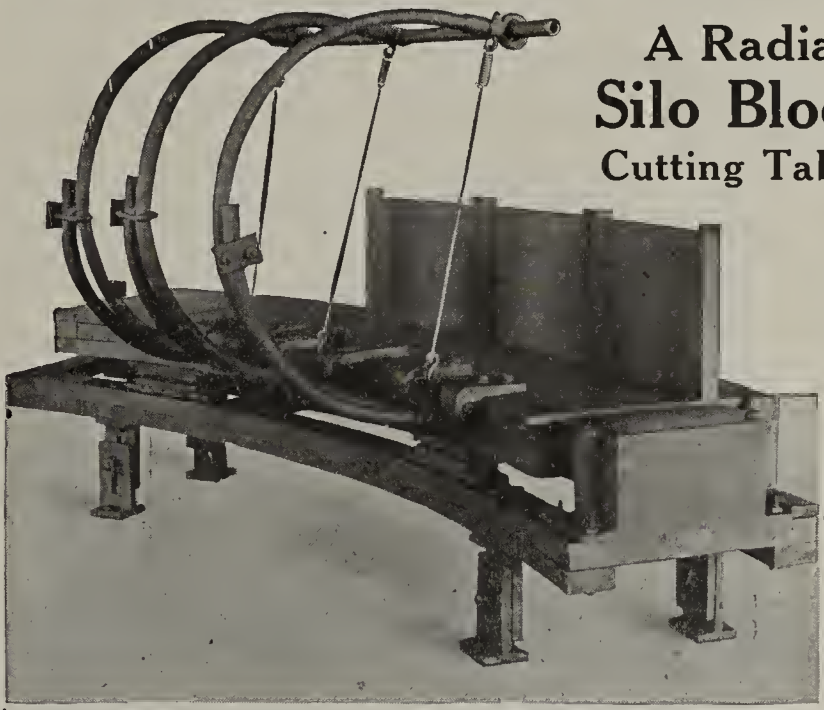
The California Paving Brick Company of San Francisco, which has been making a series of tests of a new product—a very hard vitrified paving-brick—reports the last kiln of brick turned out as having stood an unusually severe rattler test. It is expected that the paving-brick of this company will be ready for sale in the near future. F. A. Costello, president of the company, has just returned from a short business trip to Los Angeles. Mr. Costello is also president of the California Pottery Company. The main office and yards of this concern are at Mission and Twelfth streets, San Francisco, and the factory is at East Twelfth street and Park avenue, Oakland. The company makes vitrified sewer-pipe and fittings, terra-cotta chimney pipe and caps, flue lining, drain and partition tile, and other clay products. Business has been especially good with this concern during the past three months.

COLORADO

The Boulder (Colo.) Pressed Brick Company is working an extra force of men in filling an order for 3,000,000 brick for the Whittier school and shipping an order of 225,000 brick for the Frederick school building.

The plant of the Durango (Colo.) Pressed Brick Company is being overhauled and the machinery being put

THWING
HIGH RESISTANCE MULTIPLE RECORD
PYROMETERS
Never Sleep
If the burner knows that his work is being
Recorded in Ink
every few minutes, he will stay **On the Job.**
Multiple Recorders reduce the cost of installation.
How Many Kilns Have You?
Thwing Instrument Company
437 North Fifth Street
Philadelphia



A Radial
Silo Block
Cutting Table
The Farmers Will Build Hollow Clay Tile Silos
Are you prepared to manufacture—silo block—cheaply?
Get in touch with us and find out about this modern cutter.
You can't afford to be without it.
WRITE US TODAY—NOW
CRAWFORD & McCRIMMON CO.
Brazil, Indiana

"Bolt It to the Bin"

The Columbus Feeder

for automatically feeding

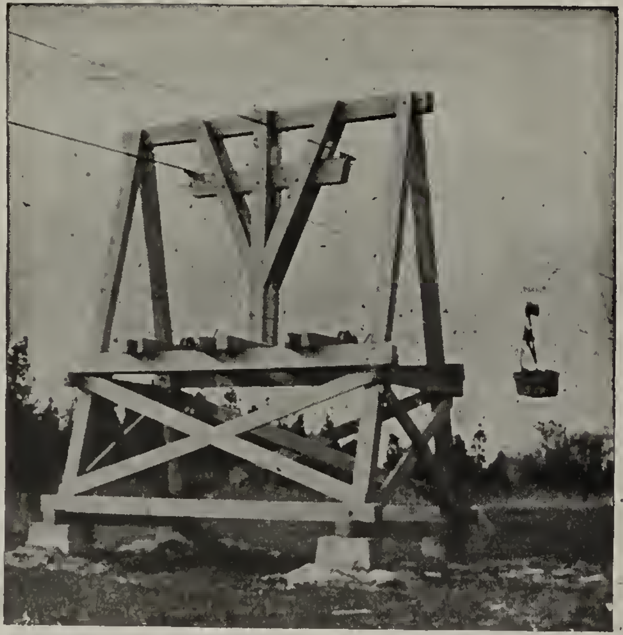
Crushed Clay to Dry Pans *and* Pulverized Clay to Pug Mills

is fast coming into general use. There's a reason. Let us show you—furnish the machine on trial.

Send for Circular.

Ceramic Supply & Construction Co.
Columbus, Ohio

If the Grade is Sufficient—Gravity Supplies All of the Power



B. & B. Friction Grip Aerial Tramway

requires only one man to operate it, will work regardless of bad weather, any capacity desired. It is perfect in construction, simple to operate, maintenance cost is low. Outline your haulage conditions and we will gladly estimate the cost and possible savings to you.

Ask for Catalog No. 16.

BRODERICK & BASCOM ROPE CO.
New York ST. LOUIS, MO. Seattle

in working order by William Strohmer, of Pueblo, Colo., preparatory to beginning operations. It is reported that the company plans to manufacture a million brick during the coming season in anticipation of a summer of unusual activity in building operations.

CONNECTICUT

Strikes of workmen at the brick yards in Berlin, Middletown and elsewhere in Connecticut have seriously hampered manufacturers during the past month and, in many instances, plants that have plenty of orders have been obliged to close down entirely. It is now believed, however, that most of the trouble is over and that all of the strikes will soon be settled. The men asked for higher wages. In Berlin alone four hundred men went on strike and, inasmuch as there already was a shortage of labor, the yards at that point were badly tied up.

DELAWARE

One of the sheds on the brick plant of the James B. Oberly Company located on Cleveland avenue and Third street, Wilmington, Del., was badly damaged recently when a wind storm upset an unusually high pile of brick.

DISTRICT OF COLUMBIA

The Washington (D. C.) office of the Hydraulic Press-Brick Company has received an order for furnishing 240,000 gray face-brick to be used in the new Wardman apartment house to cost about $300,000. West Brothers Brick Company will furnish the common-brick for this building. The Hydraulic Company has also just been awarded the contract for furnishing about 250,000 of the same face-brick for a new building being put up by private parties for the Department of Justice.

IDAHO

A new kiln is to be installed at the plant operated by William Sherwood at Payette, Idaho, which, together with other new equipment to be added shortly, will greatly increase the capacity of the plant. Already the entire year's production is sold. Two local building operations that are using brick direct from the kiln are the $50,000 hotel being built at Payette and a high school building going up at Fruitland, Idaho.

ILLINOIS

The Wantling Coal, Brick and Tile Company is the name of a newly organized concern at Peoria, Ill., with a capital stock of $100,000. Those interested in this company are Isaac Wantling, Samuel T. Thomas and William Vaughn.

James S. Nicholson of Nicholson Brothers Company, fireproofing contractors located in the Monadnock block, Chicago, has purchased the plant of the Ray (Ill.) Tile Works, and will completely remodel it, installing modern equipment for the manufacture of drain-tile, brick and hollow-tile.

According to reports from Colchester, Ill., the sewer-pipe plant being promoted at that point by A. W. Gates of the Monmouth (Ill.) Clay Manufacturing Company, is soon to become a reality. Colchester business men are said to have given the project their support and the canvass for funds is soon to start.

It is reported that Grayville, Ill., may soon have a large paving-brick plant. Little information is obtainable concerning the identity of those interested in the project, but it is known that tests are now being made of the shale at hand, which seems to have proved of high quality and is present in inexhaustible quantities.

The Monmouth (Ill.) Clay Employes Benefit Association at a recent meeting elected the following officers to serve during the ensuing year: Fred Mann, president; E. Miller, vice-president; Ralph Johnston, secretary, and C. C. Green, treasurer. The trustees for the coming year are P. L. Compton, C. A. Stevens, W. Brewer, Lester Norris and R. Robertson.

It is reported that W. C. Vittum of Ottawa, Ill., having made extensive tests of clays found on the Spicer estate at Marseilles, Ill., has leased, for fifty years, the three hundred and seventy-one acre tract of ground comprising the estate and is about to promote a company for mining the clay and also the coal that is present in large quantities.

The Barron Brick Works at Roanoke, Ill., is now being reconstructed, the work progressing at a rapid rate. Six new kilns are being built the draft for which is supplied by a single stack which thus far has been built to a height of sixty feet. A trestle is being built from the pit to the plant over which an electric locomotive will haul the clay cars. New engines have already been set as well as the brick machines. All of the old kilns and stacks of the former plant have been torn down.

INDIANA

At Madison, Ind., W. H. Miller and Sons' brick plant has been opened for the season's run. New machinery has been installed to replace the old hand method which has been in use at this plant. This step will largely increase the capacity of the plant.

The Standard Brick Company of Crawfordsville, Ind., has been making a number of improvements and additions to its plant recently. Seven new kilns have been built during the past winter and new machinery installed thruout the plant. Just recently the company has installed equipment for manufacturing a wire-cut-lug paving-brick and has also purchased a forty-acre tract of land which contains a large deposit of shale. W. H. Neff, formerly of the Wabash Clay Manufacturing Company of Veedersburg, Ind., and the Danville (Ill.) Brick Company, has accepted the position of superintendent at this plant and is now employed in that capacity.

IOWA

The Sioux City (Ia.) Brick and Tile Company recently received an order for 50,000 brick to be used in the construction of a large roundhouse now being built by the Great Northern railroad at Ihlem, Minn.

The installation of a large amount of new equipment will soon be completed at the plant of the Oskaloosa (Ia.) Vitrified Brick Company. Immense new boilers are being fired every day to season the fire-boxes. A new 250 h. p. engine has been installed, as well as a gas burning system. These improvements have more than doubled the capacity of the plant and have made it possible to operate thruout the entire year.

KENTUCKY

The Southern Brick and Tile Company has been making a few improvements at its Louisville (Ky.) office including the installation of new electrical fixtures thruout.

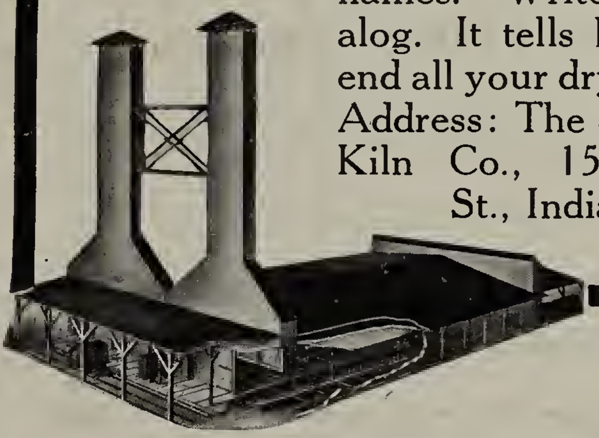
While Kentucky farmers, as a rule, do their tiling either in the fall or winter, there has been a reversal of form this season and, as a consequence, there is an excellent demand for drain-tile, showing that the farmers are waking up to

Does Your Product Check and Crack in the Drier?

It should not. With correctly designed drying apparatus it would not. These are unnecessary evils, due to wrong drying methods. A great many brick manufacturers have found out by experience that

The Standard Drying System

prevents checking, cracking and kindred evils. We would like to send you their names. Write for our catalog. It tells how you can end all your drying troubles. Address: The Standard Dry Kiln Co., 1540 McCarty St., Indianapolis, Ind.



POSTERETTES

FIRE COST THE U.S. $250,000,000. LAST YEAR
Build with Brick

160,000 of these stamps have been used by brickmakers throughout the country. As many pieces of mail, and express matter, have carried the "Build with Brick" slogan. It is printed in bright colors and "catches the eye."

How about your using some of them? It is an inexpensive way of advertising your material.

Printed in four colors

Gummed and ready to stick on your letters, envelopes and packages.

$1.50 per thousand postpaid

Send your orders to

BRICK AND CLAY RECORD
445 PLYMOUTH COURT CHICAGO

This illustrates the largest recording dial made—it records from three to twelve individual records on one chart—made by a single instrument. The size of the dial is proof against errors.

Furnished only with the

BEIGHLEE "The Pyrometer with A Conscience"

Regardless of varying atmospheric conditions the Beighlee gives absolutely correct temperatures at all times. Other clay products manufacturers have let us prove this to them—why don't you?

Write us anyway—no obligation.

Beighlee Electric Company, Cleveland, O.

Herman A. Holz, Hudson Terminal Bldg., New York City
Representative in New England States

You can get a higher price for your brick if you guarantee it will be

Scum-Proof

And you can do this with perfect safety by using

R. H. Precipitated Carbonate of Barytes

It neutralizes the salt in your clay so that it cannot appear on the surface of the brick after it gets wet.

But don't accept a substitute—insist on R. H.—the dependable brand.

Write for circular and prices.

The Roessler & Hasslacher Chemical Company
100 William St. New York

Chicago, Ill. East Liverpool, O.
St. Louis, Mo. Kansas City, Mo. New Orleans, La.
Philadelphia, Pa. Boston, Mass.

We carry a complete line of high grade chemicals for the clay industry

the advantages of proper tiling. According to local manufacturers, the demand for tile this spring has been larger than for some years past.

The Kentucky Vitrified Brick Company's plant, which is operated by the P. Bannon Pipe Company, is going after face-brick business stronger this year than ever before. This plant is now making and marketing salt-glazed and rough-texture face-brick. Common shale brick are in good demand, and the Bannon Company's plants are operating to full capacity.

Deliveries, totaling between 25,000 and 30,000 brick a day, are being made by the Hillenbrand Brick Manufacturing Company, Louisville, Ky. The company recently secured a large order for the brick to be used in the new plant of the National Foundry and Machine Company, which will require about 200,000. The plant is operating steadily and has a stock on hand of about one million brick.

The Louisville (Ky.) Brick Company reports that it is figuring on a couple of large contracts calling for about 200,000 common and face-brick each, but that things are rather quiet and the company is delivering only about from fifteen to twenty thousand brick a day at this time. These deliveries are being made from stock amounting to about a half million brick. The plant has been closed, but will open shortly.

Car shortage is handicapping the Coral Ridge Clay Products Company, Louisville, Ky., considerably at this time, according to George H. Fiedler. The company's plants are operating full time and are having little difficulty in selling all of the brick, hollow-brick and fireproofing that can be produced, but getting it delivered is another matter. So far, the embargoes placed by the railroads on eastbound cars has not improved conditions to any great extent.

With the plant of the East End Brick Company, Louisville, Ky., closed for several months the company has about exhausted its stock of brick, and at present is doing nothing. Several plans are being discussed for continuing the business, but so far no definite arrangements have been made. The clay pits at the plant "ran out" some time ago, and all clay used has to be hauled in from a distance and paid for at so much per ton. This condition naturally adds considerable to the cost of production.

Louisville builders' supply houses handling the better grade of face-brick, report that business is confined almost entirely to small contracts on residences at this time. E. P. Teague, manager of the Union Cement and Lime Company, states that his company has been handling principally side lines. H. Frazier of the R. B. Tyler Company, has a number of small orders, but nothing of importance. This same condition applies to the Tyler Building Supply Company. The latter concern, however, is fairly busy with deliveries booked six or eight weeks ago.

With the exception of small residence building there is not much work going on in Louisville just at present that requires large quantities of brick, but there are several good jobs in sight and the outlook is generally regarded as good. There is a substantial volume of church and school construction out in the state, and while some of this business is coming to Louisville, a large percentage of it is being handled by the local manufacturers. Inability to get sufficient cars for delivery out in the state is handicapping Louisville concerns somewhat in handling business outside of the city. There is a fairly good de-

mand for fireproofing, hollow-tile, drain-tile, and so forth, and most of the plants are busy.

Recent fire-brick contracts of the United States Navy Department were awarded to the Louisville (Ky.) Fire Brick Works. These contracts call for about one hundred and fifty to two hundred cars of fire-brick in various sizes, for use at the navy yards and in government vessels. The various sizes will be made up on requisition as needed. The steel and other metal industries are also buying heavily, and most of the orders being booked at this time are for future delivery—August or September—as immediate delivery is out of the question. The company's plant at Grahn, Ky., is being enlarged to a capacity of about 12,000 brick per day. Two new kilns have been built, and other work is now being done which will be finished in about thirty days.

MAINE

Work has been resumed at the Purinton brickyards, Augusta, Me., the company having orders for a large quantity of brick. Building operations in various sections of Maine are said to be unusually active and there is a heavy demand for building materials.

MARYLAND

Plant No. 5, of the Baltimore (Md.) Brick Company, located at Columbia avenue and Putnam street, in that city was swept by fire recently, caused, it is thought, by sparks flying from a nearby dump. Two buildings, housing the boiler-room and machine shop, were destroyed, a loss of about $3,000 being involved.

MASSACHUSETTS

Fire "bugs" are believed to have been responsible for a blaze which recently destroyed a building at Belmont, Mass., owned by the New England Brick Company. The building formerly was used as a boarding house, but of late had not been occupied.

Brick manufacturers in western Massachusetts, particularly in the vicinity of Springfield and Holyoke, have been having some trouble in getting their plants in operation because of labor difficulties, but most of the strikes have been satisfactorily settled and work resumed at the yards.

Word comes from Stoneham, Mass., to the effect that heavy motor trucks are damaging the Massachusetts highways to such an extent that the state highways commission is seriously considering adopting brick as the paving material in the construction of new roads.

The new $30,000 steam drier being installed in the Cambridge (Mass.) yard of the New England Brick Company is rapidly nearing completion. It will enable the company to manufacture brick during the entire year regardless of the weather. This will mean much to the company in view of the fact that the brick from this yard are for consumption in Boston.

MICHIGAN

Charles H. Bryan of the Mercier-Bryan-Larkins Brick Company, Detroit, contributed the services of all his company's teams, wagons and men for "Clean-Up" week—May 15 to 22.

Bricklayers were the highest paid of all the building trades in Michigan during 1915, according to the latest report of the Labor Commissioner. There were about 1,118 bricklayers in the state and they received an average of $5.08 per eight-hour working day.

The Wolverine Brick Company, located just outside Owosso, Mich., is reported to be doing an excellent bus-

Genasco Expansion Joints

Have all the advantages of other prepared joints for brick and block pavements—**economy, ease of installation, the avoiding of melting and pouring**—and besides this

Are All Asphalt

The **entire thickness** of a Genasco joint serves the purposes of expansion and contraction. Ready-made joints that contain felt or some other form of re-enforcement cannot do the work of the Genasco all-asphalt joint. Any thickness or depth.

The best way to judge this joint is to see it. A life-sized sample will be sent to any one interested. Write for it today.

The Barber AsphaltPaving Company
Philadelphia - - - Penna.

iness this year. Orders at this time of the year are much in advance of those received during the same period last year, and a continuation of prosperity is anticipated by the company.

The Colonial Brick Company is now comfortably situated in its handsome new quarters in the Penobscot building, Detroit, Mich. Harold W. Holmes, general manager, reports that arrangements have been made for a permanent yard at Third and the Michigan Central Railroad which will cover one acre of ground. Business, says Mr. Holmes, has been excellent during May. The officers of the Colonial Brick Company are Mr. Holmes, president, and Frederick C. Solms, manager, with Claud W. Filer and Arthur H. Ledbetter as salesmen. The company is specializing in face-brick. Adjoining its offices is an excellent display room, more than eighty different kinds and combinations of brick being shown.

MINNESOTA.

The No. 3 plant of the Red Wing Sewer Pipe Company, located at Hopkins, Minn., is now making drain-tile exclusively, and reports a good demand for its vitrified product.

The Fowler and Pay Brick Company of Mankato, Minn., recently constructed a new round down-draft kiln with a capacity of 165,000 brick. It is planned to build another one this fall.

In common with all brick manufacturers of the Northwest, Fred Aufderheide, proprietor of the New Ulm (Minn.) Brick and Tile Company reports the demand as being in excess of the capacity of his plant.

What bids fair to become the largest plant in the Northwest is now under construction at Springfield, Minn., being built by the A. C. Ochs Brick and Tile Company. Every principle of modern clay plant arrangement is being recognized in the construction of this plant, guaranteeing not only a large factory but a very efficient one.

Thoughts are now being entertained by the owners of the Nelson Brick and Tile Company of Albert Lea, Minn., to change the product of their plant from drain-tile to soft-mud brick. The reason for this is that the clay, when taken from the pit after a rainfall, is very plastic and hard to work, due to the excess moisture. Also drying troubles arise from this cause. However, it is thought that if a soft-mud brick were made the difficulties arising from wet clay would not be nearly so troublesome as with the present product.

According to H. S. Wellington, salesmanager of the Minneapolis (Minn.) office of the North Iowa Brick and Tile Company, thus far this has been a record year. This company manufactures drain-tile exclusively and by midwinter advertising induced the farmers to place their orders early, thus enabling them to handle a large volume of business when the spring rush came. The entire capacity of the plant is sold. The problem that presents itself now is how to refuse diplomatically new orders that are constantly being received.

The Zumbrota (Minn.) Clay Manufacturing Company could sell twice the amount of drain-tile and building-tile that it can make this season, according to W. Reimer, manager of the company. This concern, by consistent advertising of burned clay products among the farmers in its locality, has built up a demand that it can not begin to meet with its present equipment, and so expects to enlarge the plant soon. An addition to the drier, made early this spring, has greatly increased the capacity of the

Your Last Chance
To Get These Reprints

All but the small number indicated have been sold and the plates destroyed.

No More Will Be Printed
so get your order in now for those you want.

These reprints of timely articles published in former issues of "Brick and Clay Record" make excellent educational and advertising literature

They Will Sell Your Product

Paving Brickmakers—You can use the first five—they have won contracts for others—they will do the same for you! Here is a list of those on hand and the quantity available:

No. 1. "The Truth About the Concrete Roads of Wayne Co."—October 7th, 1913, issue. A 16-page folder, 9x12, in which Paul E. Green, M. E., tells the story of his complete investigation for the tax-payers of Highland Park, Ill., by whom he was sent to get the truth. Profusely illustrated. $2.50 per 100; $12.00 per 500; $20.00 per 1,000.

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No. 2. "Creosoted Block a Failure"—November 4th, 1913, issue. Chicago's experiences with wood block graphically told in pictures and type in the form of a 4-page Insert at $2.00 per 100; $5.00 per 500; $8.50 per 1,000.

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No. 3. "Chicago Concrete Streets a Failure"—March 7th, 1914, issue. A similar story of Chicago's experience with concrete instead of wood block as above, in the same form and at the same price. A valuable piece of literature in concrete road competition. $2.00 per 100; $5.00 per 500; $8.50 per 1,000.

1000 Left

No. 4. "Gov. Glynn (N. Y.) Urges Use of Brick Roads"—April 7th, 1914, issue. An 8-page folder in which Gov. Glynn, of New York, not only gives his views on the exclusive use of brick for the highways of New York, but backs them up with indisputable facts. $4.00 per 100; $15.00 per 500; $20.00 per 1,000.

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No. 5. "Economy in Brick Paved Roads"—June 2nd, 1914, issue. An 8-page folder, containing address delivered by Will P. Blair, Secretary of the National Paving Brick Manufacturers' Association, before the First Canadian and International Good Roads Congress, held in Montreal, P. Q., May 18-23, 1914. It is well illustrated with numerous views of brick paved roads; and these pictures are the best answers that can possibly be given the advocates of concrete and other "so-called" permanent pavements. Prices: 100 for $4.00; 500 for $15.00; 1,000 for $20.00.

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No. 6. "Safe Factory Construction"—August 1st, 1913, issue. An 8-page folder. Prices: 100 copies for $4.00; 500 for $15.00; 1,000 copies for $20.00.

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No. 7. "The Silo—How to Make It Permanent"—October 21st, 1913, issue. An 8-page reprint. Prices: 100 for $4.00; 500 for $15.00; 1,000 for $20.00.

2000 Left

Send Your Order Today to

Brick and Clay Record
445 Plymouth Court Chicago

plant but not enough to enable all the orders received to be filled.

The Jackson (Minn.) Tile and Brick Company, under the direction of its manager, S. G. Cass, is making many improvements on its plant at that point to enable it to take care of a greatly increased demand for its products. The clay storage sheds are being enlarged to three times their former capacity, a new thirty-foot down-draft kiln is being constructed and an addition is being made to the steam drying sheds. Also a trestle is being built to the storage sheds that will greatly facilitate the hauling of the clay. A gasoline locomotive will supplant a team of horses previously used in hauling the clay cars.

MISSOURI

H. M. Baldridge, for many years the owner of a brick and tile plant at Illiopolis, Ill., has given up that plant and is starting another one at Hannibal, Mo. During the coming months Mr. Baldridge intends to make many improvements on the new plant, important among which will be the construction of new kilns and an addition to the drier.

MONTANA

The Polsom (Mont.) Chamber of Commerce is attempting to attract a brick manufacturing plant to that point. It is claimed that the clay there is suitable for brickmaking and a good demand exists for the product. In order to further stimulate interest in the building of a local plant, several large contracts are being held out to the manufacturer locating there.

Capitalized at $50,000 and with title to eighty acres of land on which there are two large veins of coal separated by seven feet of shale, the Roundup (Mont.) Brick and Tile Company has filed articles of incorporation and work is to be started upon the construction of the plant very shortly. More than $13,000 in cash subscriptions has already been received.

NEW HAMPSHIRE

Brick plants in the vicinity of Rochester, N. H., are said to be suffering from a scarcity of labor, the Russians and Poles who constituted the large majority of the help on most of the plants having gone home to take part in the European conflict.

NEW JERSEY

Work is now under way for extensive additions to the C. Pardee Tile and Steel Works in Perth Amboy, N. J. The Pardee Company owns about eighty acres of land in the vicinity of its plant on the Raritan river and it is reported that several more large additions will be made.

All of the brick and fireproofing plants in the vicinity of Perth Amboy, N. J., are operating to capacity at the present time. Since a voluntary increase in wages was given the men on March 1, by all of the clay plants in central New Jersey, there have been little or no labor troubles, altho there is a marked scarcity of men.

Thru the efforts of Sheriff Edwin W. Houghton, the recent strike at the Sayre and Fisher plant at Sayreville, N. J., on the Raritan river, has been settled. Unaided, the Middlesex county sheriff acted as mediator, with the result that all of the striking workmen have returned without receiving their demands, which included a raise of three cents an hour and a shorter working day.

NEW YORK

The stockholders of the Ostrander Brick Company of Troy, N. Y., at a recent meeting elected the following

GANDY

Try GANDY for that Hard Belt Service

WHERE everything is against the belt—where it is subjected to dampness, oils, greases, dust or dirt—try Gandy.

Because Gandy for 37 years has demonstrated that it can stand up against such conditions. Proof is all around you.

Gandy runs straight and true, and has a tenacious cling on the pulleys that reduces belt slippage and power waste.

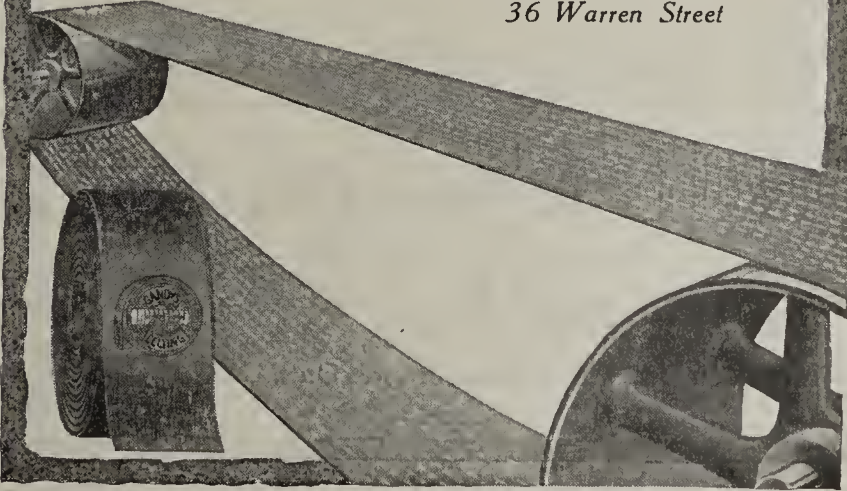
Make the next belt a Gandy Belt. Be sure you get The Gandy Belt, with the Gandy trade mark stamped throughout the length of the roll.

Our stock comprises all widths and all plies from as narrow and as light as 1″ 4-ply to as wide and as heavy as 30″ 10-ply. This means your orders can be filled promptly with well seasoned stock.

Leading supply houses everywhere carry Gandy. Or write direct to us for a sample and prices. There is no obligation.

The Gandy Belting Company
732 West Pratt Street Baltimore, Md.

New York Branch
36 Warren Street



Because the HOOK SYSTEM saves fuel, time and labor—it saves money.

That it **does** save these vital business elements, we hope you'll make us prove.

It is entirely possible for you to improve the quality of your ware and at the same time effect a substantial reduction in cost of production by the HOOK SYSTEM.

Old kilns can be changed to HOOK system at very small comparative cost. New kilns of this system usually cost less than other types.

You will find, from a definite profit standpoint, that this bears close investigation.

Write us today.

Hook Patent Kiln Company
VIGO, OHIO

Canadian Office,
250 Dufferin Street, Toronto, Ont., Can.

directors: F. A. Ostrander, J. K. Pine, Clarence N. Flack, J. W. Podmore and R. Rynders, Jr.

Rapid progress is being made in preparing the plant of the Hayden Brick Company at New Windsor, N. Y., for the season's run. A number of workmen are now stripping the clay bank and preparing a suitable bench of clay, besides leveling up the drying yard. James Murray of Newburgh, N. Y., has been engaged as foreman for the coming year.

OKLAHOMA

The W. S. Dickey Clay Manufacturing Company of Kansas City and St. Louis, Mo., has had a representative inspect the Taft gas fields at Muskogee, Okla., gathering data as to the amount of gas available for the manufacture of brick and tile. Should it be found that sufficient gas can be had, it is reported the company will immediately begin the construction of a large tile plant, together with an equally large brick plant, near the clay pits.

ONTARIO

The Milton Pressed Brick Company has been incorporated at Toronto, Ont., with a capital stock of $1,500,000. John S. Connell of Milton, Ont., is president of the new organization.

OREGON

Work has been started on the construction of the new Warrenton (Ore.) Clay Company's plant. A spur line, 4,200 feet in length, is being constructed at the present time and work on the erection of the buildings is expected to start very shortly. George W. Warren, president of the company, George Crew, vice-president and Warren Overpack, general manager, have left on a three or four weeks' inspection trip of the large clay plants in the Middle West and Canada, preparatory to deciding upon the equipment to be installed at the Warrenton plant.

RHODE ISLAND

The reconstruction of the Barrington (R. I.) Steam Brick Company is progressing rapidly but it will take several weeks before the destroyed buildings are entirely replaced. A new brick stack was recently completed.

SOUTH DAKOTA

Articles of incorporation have been filed by the Watertown (S. D.) Brick Manufacturing Company which is to have a capital stock of $50,000. The incorporators of this company are George W. Case, C. H. Atkinson, both of Watertown, and H. E. Dickensen of Huron, S. D.

TENNESSEE

The Southern Brick and Tile Company of Jackson, Tenn., which recently resumed operations, is running to full capacity. An order for 5,000,000 fire-brick just received for delivery this year, will keep the plant busy for some time to come.

TEXAS

An amendment was recently filed by the San Antonio (Tex.) Lime Brick Company, increasing its capital stock from $20,000 to $36,000.

UTAH

The Provo (Utah) Pressed Brick Company, because of an unusually large number of orders on hand, intends to start a night shift to catch up with the demand, provided the necessary labor can be obtained.

WASHINGTON

The Wenatchee (Wash.) Brick and Tile Company has been incorporated with a capital stock of $10,000. Those interested in this new Far West company are W. M. Bird and J. F. Hobson.

As a result of the increased demand for building materials in the West, all the plants of the Washington Brick, Lime and Sewer Pipe Company, located at Spokane, Wash., are in operation. For the first time in two years this company is operating its common-brick plant at Freeman, Wash., and reports a good business at its sewer-pipe plant at Spear and its terra cotta plant at Clayton.

WEST VIRGINIA

At the annual meeting of the Potomac Fire Brick Company of Piedmont, W. Va., held recently, the following officers were re-elected: John A. Caldwell, president; M. A. Patrick, vice-president; John P. Miller, secretary and treasurer and W. F. Caldwell, manager, as well as the remaining members of the existing board of directors. This company is now on its feet and is making considerable progress.

WISCONSIN

The Whitewater (Wis.) Brick and Tile Company has started the construction of its new plant to be built at that point, the operation of which is expected to begin about July 1. A stock issue of $50,000 has been disposed of to finance the project.

HOW DO *You* BUY COAL?

(*Continued from page* 1038.)

has received a good bid on another coal. He knew what he needed, and by consulting accurate records he found that this last coal would fulfill his requirements. He knew he could change to it without danger of spoiled product and he made the change. And by so doing he shaved off another five cents a ton.

Another large plant manufacturing a clay product reduced its fuel cost per ton of output from $2.69 to $2.07 by similar methods.

ANOTHER PLANT HAS SIMILAR EXPERIENCE

Now let me tell you about a plant in another line of work. These people were burning one of the best advertised coals on the market, and the particular shipments being delivered to them were somewhat better than the average. Incidentally, they were paying ten cents a ton more at the mines for it than another plant located five city blocks away was paying for the same coal. However, they didn't know that. They decided that their power was costing too much, and they set to work to reduce it. The procedure was the same as in the former case. They knew absolutely the characteristics of the coal they were using, and which was giving them satisfaction. Exact records proved that there were at least ten other coals having the qualities required, and so they asked for prices on these coals. When the bids were opened and tabulated, they found that of these ten coals that

Coal No. 1 saved them 26 cents a ton.
Coal No. 2 saved them 23 cents a ton.
Coal No. 3 saved them 18 cents a ton.
Coal Nos. 4 and 5 saved them 17 cents a ton.

KOPPEL

Electromobile Industrial Trucks

Pay for Themselves In Less Than One Year

Broadly guaranteed and costs less than 75 cents per day to operate.

Write for catalogs on Electromobiles, Clay and Dryer Cars, Portable Track, Rails, Switches, Steel Ties, etc.

ORENSTEIN-ARTHUR KOPPEL CO.

The "Electromobile"—Electrically driven Industrial Truck

SALES OFFICES:
New York Chicago Pittsburgh San Francisco
Branches throughout the world

PLANT: KOPPEL, PA.

And the other five saved them smaller amounts, but every one of them showed some saving.

Many similar cases could be cited, but the procedure and details in all of them would be much the same. It is in every case merely the application of common-sense methods backed up by exact information and records, and altho in a brief paper it is impossible to cover this point explicitly, it is nevertheless true that this same sort of information and records serve not only as a check on the character of the coal but also on its quality.

Now what I wish to emphasize especially is this: seventeen or twenty-six or thirty-five cents a ton saving is a thing to be desired but it is far from being the entire advantage. The big point is that while you are making these changes you run no risk. You know in advance that the new coal will work and at any subsequent time you are free to make further changes whenever a financial advantage may appear if you have at your command records which show that the coal you are considering has the characteristics you require.

"PET" COAL A FALSE IDEA

The "pet" coal is a bogeyman and I believe that its day has come. As an institution it is still in pretty good condition and probably will be for some time to come. The man who has a "pet" coal is like the man who went out to hunt a bear. After he caught the bear, he had to hire two men to help him let go. Assuming now that you are unfortunate enough to have caught a "pet" coal, how are you going to get away from it? You should know the characteristics of the coal you can use. You should know how far your present plant equipment will allow you to go in varying the characteristics of you coal. And if you are going to get the most for your money, you should know the greatest possible number of coals that will work well in your plant. This is perhaps the hardest part of the problem for the plant manager to solve unassisted. To make a thoro search of the market would be an interminable job, and discouraging because of the inaccurate information which is almost uniformly furnished by the coal producers, partly from actual ignorance of their own product; partly due to the lack of exact knowledge on the part of the consumer which permits one coal dealer to obtain business on misrepresentation and almost forces like misrepresentation upon his competitor.

QUICK INFORMATION ON COAL HARD PROBLEM

Harrington Emerson defines personal efficiency as "the best, easiest and quickest way of obtaining the *most desirable results.*" The problem, the biggest problem in fuel economy before the manufacturer of today is to obtain the most reliable information on available coals in the best, easiest and quickest way. In general, this can only be obtained thru a system of co-operation in the collection of coal data in one place, and its thoro and complete organization for instant reference by an individual in need of specific data. This is necessary to make really effective the knowledge gained thru a careful analysis of any particular set of requirements, for clearly there can be no advantage in finding out the characteristics a coal must have to be successful in a given plant, if it is impossible to state definitely which coals on the market supply the requisite qualities. And a careful study of plant requirements, coupled with a comparison of available suitable coals, always pays, and not only in cash, but also in a sense of security.

The Price of Coal

subject to such uncertain conditions as exist at the present time, demands that you keep a watchful eye and an open ear upon this big factor of your operating expense.

The price of coal will not be any lower than it now is, and will undoubtedly go much higher within the next few months, because of the material increase in miner's wages and mining supplies.

THE BLACK DIAMOND

Each weekly issue of THE BLACK DIAMOND treats with conditions as they arise, and tells of the probable bearing they will have upon the future price and supply of coal.

Considering the small cost of but 6c a week ($3.00 a year), THE BLACK DIAMOND is the cheapest, safest and most satisfactory form of fuel insurance a clay-product manufacturer can carry.

Follow the path of live and progressive brick and tile makers everywhere, and become a regular reader and subscriber to THE BLACK DIAMOND,—**for over 30 years the coal trade's leading journal.**

Write now for a sample copy.

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Descriptions of Machinery and Accessories and Detailed Announcements that Our Advertisers Believe will Interest Our Readers

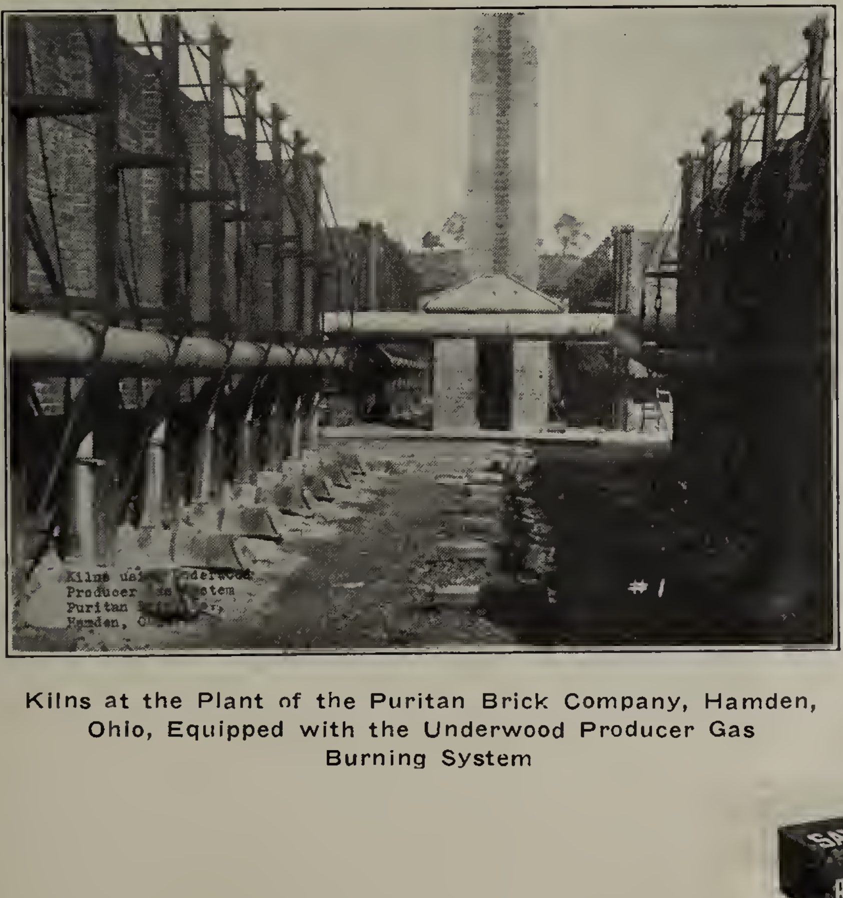
Producer Gas a Big Success

In "Brick and Clay Record," issue of October 21, 1913, there appeared an article under the caption: "Offers Burning System That Cuts Time and Cost at Kiln." It set forth the results brought about by the first installation of the system worked out by John T. Underwood, and now known as the Underwood Producer Gas Burning System (Patented). That article told of investigations that had been made by a disinterested party, who found that "the Underwood System, in actual practice, was burning a kiln in four days that formerly required six days—burning brick with $2.30 coal at a cost of 60 cents per thousand as against $1.90 in previous performance—and making a hard-burned face-brick from a clay that formerly made only commons."

Naturally that article created nation-wide comment because, to quote again, "these claims cover practically every point the clayworker has demanded for the ideal system and, *if true*, indeed will mark a revolutionary step in the clay-product industry." Pilgrimages were made to see this wonderful system, and those who went departed filled with enthusiasm. Of those who stayed at home, the great majority doubted the tale because "theory" told them it could not be so. Such has been the history of all great movements—"they went to scoff, but returned to praise."

Events followed fast, and in the following issue of "Brick and Clay Record" announcement was made that the Manufacturers Equipment Company, of Dayton, Ohio, had completed arrangements with John T. Underwood whereby that company would assume the sale of, and give financial backing to, the devices which Mr. Underwood had patented, and would oversee their installation in clay plants in the United States and Canada.

Then the "battle" began, and for nearly three years it has been a battle royal; there have been moments of despair—but always faith and confidence in the successful outcome. Week by week—month by month—there has been real progress, and now, with numerous plants in Ohio, Indiana, Michigan, Illinois, Kansas, Iowa, Wisconsin and



Kilns at the Plant of the Puritan Brick Company, Hamden, Ohio, Equipped with the Underwood Producer Gas Burning System

Will You Read This

Rutledge & Taylor Coal Co.,
St. Louis, Mo.

Gentlemen: Replying to your inquiry of January 7th with regard to the Rutledge & Taylor Livingston coal. We are pleased to advise that we have used this coal for about four years and find that it is excellently well suited to our purpose.

This coal fires freely, with a long flame and a small amount of clinker and ash.

We also find its effect on the kiln is not so severe as other coals which we have used, and that the service given us by your company is very excellent.

Trusting that this gives you the desired information, we are

Yours very truly,
The Kankakee Tile & Brick Co.,
SDK/FAS By S. D. Knight.

Now—

How can you refrain from asking us to ship you enough

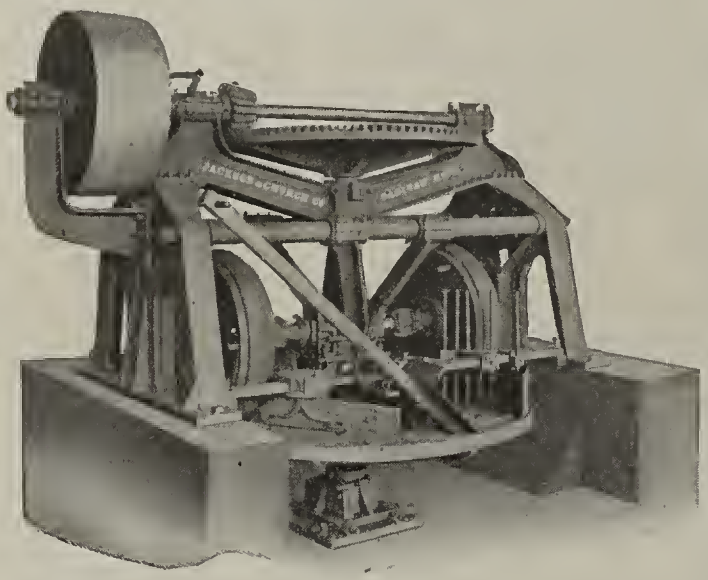
LIVINGSTON or NOKOMIS COAL
(They're both excellent)

so you can try it. Give it a thorough test—compare the results with that of any other coal—you'll soon be convinced that our coal is cheapest and that it makes a better product.

And don't miss what Mr. Knight says about R. & T. Service—you know how important this is.

We can ship anywhere west of Indiana on Big 4, C. & E. I. and I. C.

Rutledge & Taylor Coal Co.
St. Louis, Mo. Chicago, Ill.


Grinding Pan

Wet or Dry

Especially rugged and substantial. Nine-foot size weighs 40,000 lbs. Large shafts with bearings close to point of labor. Accessible adjustable step box. Extra heavy mullers and wear plates of hard white iron. All parts interchangeable. Repair parts always in stock and low in price.

Jackson & Church Co.

Saginaw, Mich.

Builders of a complete line of machinery for making Sand-Lime Brick. Boilers, Rotary Dryers and Kilns, etc.

New Jersey using the Underwood System, it is a positive success in the burning of clay products in periodic kilns of any size or type.

No one dares to deny this because the facts would belie them, for in every plant where it has been installed it has been accepted and paid for, and every user stands ready to attest to the fact that the Underwood System is permanent, substantial, effective, economical and profitable. The invitation is out for any clay-products manufacturer to write to, or visit, any plant where this system has been installed—to make a direct and impartial investigation. Anyone who will do this cannot help but become imbued with the enthusiasm that is invariably aroused in all who learn the facts.

One of the latest plants to attest to the wonders of the Underwood System is the Keller Brick Company, of Cuyahoga Falls, Ohio. Chas. Keller, of that company, said recently: "We are using 40 per cent. less fuel than formerly, and are making a hard-burned face-brick that sells for more than double the price we were getting for the commons, which was the best brick we were able to make from this same clay before we installed the Underwood System."

A written guarantee is given that the fuel saving will be at least 25 per cent.—yet in no case has it been less than 35 per cent. to 50 per cent. Yet this is only one of the many economical advantages of this system. It enables you to concentrate your coal in one spot—it does away with ash removal because there is no unburned coal—there is no dust. Plants that formerly burned brick by direct coal fire handled their coal at a cost of 15 to 25 cents a ton, and this was cut down, after the Underwood System was installed, to *one* (1) *cent* a ton.

Think, too, of what it means to have clean yards—it makes for greater efficiency in every other department of the plant.

And—there is one other fact you can't get away from: those plants that adopt the Underwood System can successfully meet the competition of those who continue burning by direct coal firing. And that's a mighty big factor.

The Manufacturers Equipment Company, of Dayton, Ohio, are ready to submit their evidence to anyone who is interested, or to give the names and addresses of every concern that has installed the Underwood System.

Stanley H. Rose, until recently in charge of the New York office of the Bureau of Foreign and Domestic Commerce of the Department of Commerce, has been engaged by The Barber Asphalt Paving Company to direct its foreign trade department.

Prior to his appointment as commercial agent of the Bureau, Mr. Rose had had an extensive business experience in the larger part of Europe, Australia, New Zealand, India and Egypt, and has also held important posts with American and European firms engaged in foreign trade. He is considered an expert in foreign tariffs, trade regulations and shipping. As special agent

U. S. Brick Company, Tell City, Ind., Where the Underwood System Is Used Successfully

of the Bureau of Foreign and Domestic Commerce, Mr. Rose has just completed a tour of more than fifty cities of the Middle West, South and Southwest, acquainting manufacturers with foreign trade opportunities and advising commercial organizations as to the best methods of promoting export trade. Mr. Rose was educated in London, Berlin, Paris and Brussels, and speaks most of the modern languages.

The Barber Company's export trade in paving materials, roofing and other asphaltic products will hereafter be in Mr. Rose's charge, with headquarters in Philadelphia and New York.

Plan Your Summer Vacation Trip

Hundreds of delightful lakes and resorts are situated in Wisconsin along the Chicago & North Western Railway, the upper peninsula of Michigan and southern Minnesota. They are in a region where one may escape from the heat and dust of the city, where the nights are cool and restful, the days full of sunshine, and where there is an evenness in climatic conditions and a purity of atmosphere that cannot be surpassed.

Within a hundred miles of Chicago one can make choice of a place for the summer sojourn from among hundreds of these resorts, where the finest of fishing, bathing, boating and yachting are at hand, where golf and tennis, riding, driving and automobile tours, thru the adjacent country, are at one's ready disposal, and where, with the complete quiet of rural surroundings, all the conveniences of city life are provided. The hotel accommodations at these resorts are ample and of a wide range of quality, which permits the full indulgence of individual tastes and means.

Round-trip rates are in effect during the summer season from all points and the train service of the Chicago & North Western Line is such that one may spend the vacation period within an hour of Chicago, or may select some one of the hundreds of points situated in the Great North Woods, and reached by a night's ride in thru Pullman sleeping cars that land the expectant traveler in the heart of the woods in time for an early breakfast.

Up-to-date Temperature Control of Kilns

While pyrometers have become very generally used among clayworking plants, the large percentage of manufacturers apparently do not appreciate the practical advantage of pyrometers for doing away with the old guess work method of burning for a more up-to-date and efficient method. This is probably due to some extent to the more scientific principles involved in the manufacture of such instruments. Due to long experience a brick manufacturer can readily grasp the principles of construction of an auger or crushing machine, tho considerable changes and improvements may be involved. The fact that with an electric pyrometer the temperatures of his kilns may be measured and read on indicating and recording instruments hundreds of feet away is an entirely new idea.

For use in brick plants a pyrometer equipment must be extremely robust in construction to conform to the rest of the brick plant equipment. It is not reasonable to expect a man who has, perhaps for years, been accustomed to heavy machinery to be proficient in the care of delicate instruments. For this reason great care should be exercised in the purchase of a pyrometer equipment, and one of the best and surest ways is to secure a pyrometer with a known reputation. The rapid progress in the perfection of Brown pyrometers for this severe service has placed them in the fore front for measuring kiln temperatures.

An installation of pyrometers which should be of interest is the Brown pyrometer equipment installed on the 15 rectangular kilns of the Metropolitan Paving Brick Company (Illus. 1). At this plant they have inserted two thermo-couples in each kiln, about one-third distance from each end of the kiln. All thermo-couples on one end of the kilns are connected to one indicating pyrometer through a switch. A similar indicating pyrometer and switch are in use for the couples inserted in the other end of the kilns.

Bucyrus-Westinghouse Electric Dragline Excavator at Plant of Cherokee Brick Co., Macon, Ga.

Westinghouse
Electric-Driven Shovels

do everything steam shovels can do, and

Do It Better

Why bother with coal, service pipes, water supply and other inconveniences common to all steam-driven shovels, when you can do away with them by using electric-driven shovels?

Westinghouse Electric-Driven Shovels are always ready for work at a minute's notice; require no licensed engineer; are most economical to maintain and operate; have no standby losses.

The Westinghouse Motor and Control equipment is specially designed for the service, and is so simple and reliable that anyone of ordinary intelligence quickly becomes an expert operator.

Ask our nearest office to send you Descriptive Leaflet No. 3710; it gives some interesting particulars.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.
Sales Offices in All Large American Cities

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Illustration 1—Brown Instrument Installation at Plant of Metropolitan Paving Brick Company, Canton, Ohio

Two recording pyrometers are so installed in the superintendent's office that these two recorders can be plugged in to any two of the 30 points on the 15 kilns. This arrangement provides for taking temperature records on the two thermo-couples installed in any kiln, or the recorders can be switched on to any two couples on the front or back ends of the kilns. This equipment you can readily note provides for securing all the information necessary, making complete data regarding temperatures carried in the kilns, yet does not overload the plant with a lot of apparatus.

In Illus. 2 is shown another installation of a Brown pyrometer equipment connected to 30 kilns at the plant of the Terre Haute Vitrified Brick Company, Terre Haute, Ind. This plant is one of the most progressive paving brick plants in the country. They burn an extremely hard shale which requires careful firing. With the assistance of the Brown pyrometer better results have been secured than ever before.

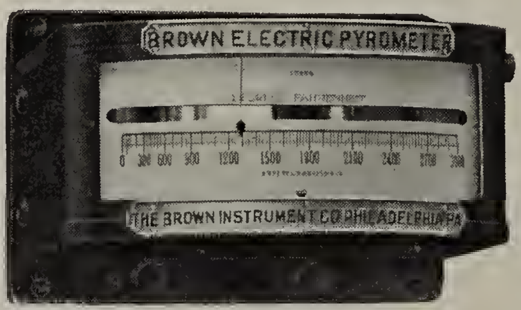


Illustration 3

In Illus. 2 the thermo-couples can be plainly seen as inserted through the crown of each kiln, as well as the wiring to connect each thermo-couple to the indicating pyrometer installed in the burner's office. In firing these kilns the temperature is brought up to a certain point within a given time, so that the kiln increases in temperature steadily and is burned off without any setbacks. This shortens the time of burning, and assures Mr. Hoskins, manager of this plant, a known percentage of well burned brick. Since using Brown pyrometers this percentage does not vary two to three points each burn. As the quality of clay and draft conditions affect the kiln conditions somewhat these small differences in percentage are most likely due to these causes.

In addition to the indicating pyrometer, a recording pyrometer is located 300 feet distant in the superintendent's office. A check is kept on the temperatures carried in the kilns, and compared with the chart given the burner to follow in firing his kiln. If there is any variation in temperature shown on the chart it can be "put up" to the burner for an explanation. The plain visible scale on the indicating pyrometer for use of the burner is clearly shown in Illus. 3, while a large view of the recording pyrometer is shown in Illus. 4.

One of the greatest problems in the selection of pyrometer equipment is the type of thermo-couple to be installed in the kilns. Considerable progress has been made by this company in perfecting a thermo-couple made of an alloy of steel. This couple has been found to be quite satisfactory for temperatures of kilns under 2,200° F., and above that point they give a limited service. The best thermo-couple for continuous service, however, is composed of chemically pure platinum 100 per cent. one side of the couple, and platinum 90 per cent. and rhodium 10 per cent. for the other side. As a manufacturer of both platinum rhodium and base metal thermo-couples we endeavor to recommend to our customers the very best type of couple for each individual requirement.

In addition to the plants previously outlined using platinum rhodium couples, a number of plants such as the Brick, Terra Cotta & Tile Company, Corning, N. Y., and the Bessemer Limestone Company have had our pyrometers with base metal couples installed for a number of months and report very satisfactory results. In time, however, replacements of the couples will be necessary which are not so frequent when platinum rhodium couples are used. Special water and dust-proof caps fit over the thermo-couples, preventing any damage to couples from exposure to the elements.

The Brown Instrument Company, Philadelphia, Pa., also has provided a corps of expert electricians, with

Illustration 2—Installation of Brown Pyrometer Equipment at Terre Haute (Ind.) Vitrified Brick Company

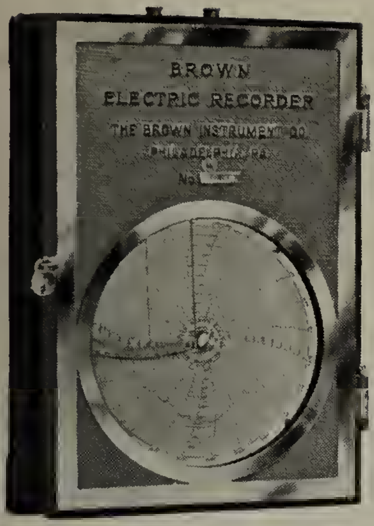


Illustration 4

branch offices in the various industrial centers, so that the installation of pyrometer equipment can be readily made without excessive cost, and these equipments kept up to their maximum efficiency.

A handsome new 72-page catalog has just been issued fully describing the various types of improved pyrometers manufactured by this company, and they will gladly forward a copy upon request.

The fact that companies who have installed Brown equipment in one plant, have given repeat orders for other plants under their control, must have a very significant meaning. As one user expressed it: "The very best thing at our plant today is the complete indicating and recording system of pyrometers the Brown Company installed for us in 1914."

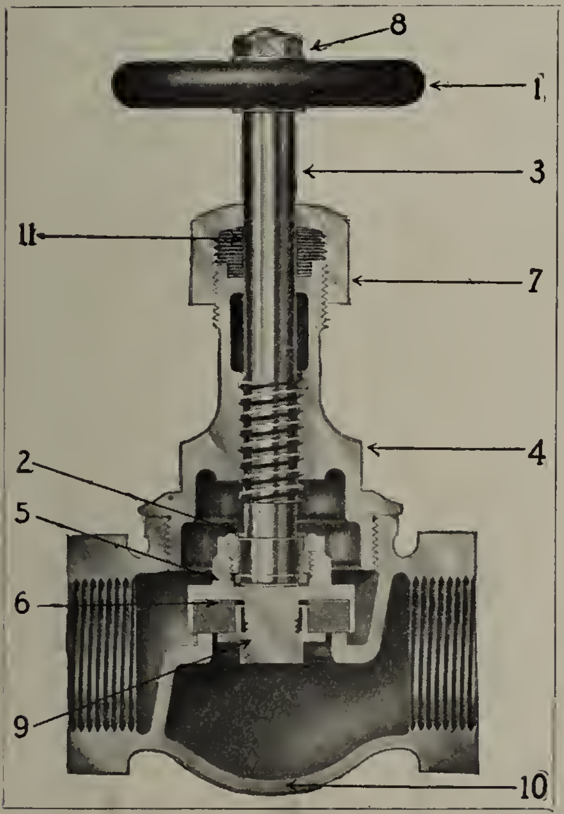
Jenkins Bros. Valves

The introduction of the Jenkins Bros. renewable disc valve brought before steam users a radically different valve from the old style or solid metal seat pattern.

The Standard Pattern, brass, differs from the old style or common metal seat valve primarily in the arrangement of the seat and disc. Instead of employing a solid metal clapper, they are fitted with the Jenkins composition disc, shown at point 6, contained in a brass disc holder, and this disc, when the valve is closed, rests upon a raised brass seat in the body of the valve. The Jenkins disc being somewhat resilient, presents a slightly yielding surface to the valve seat, and adapts itself to any roughness or unevenness of the seat, thereby insuring perfect tightness.

In the case of grit or scale lodging on the seat, this foreign matter usually imbeds itself in the composition disc without injury to the metal seat. If the disc should become cut on account of valve being throttled constantly, or become worn out thru hard service, a new disc can be substituted quickly and cheaply.

While the composition disc was the principal feature of the original Jenkins Bros. valve, from time to time improvements have been made to keep these valves up to the high standard established many years ago. The disc removing nut and nut lock, designed to facilitate



DESCRIPTION OF PARTS

1. Wheel
2. Lock Nut
3. Spindle
4. Bonnet
5. Disc Holder
6. Disc
7. Waste Nut
8. Wheel Nut
9. Disc Nut
10. Body
11. Stuffing Box Packing

Sectional View of Jenkins Bros.' Brass Globe Valve, Standard Pattern

Absolute control of air flow and temperature are features that enable us to fit the

Proctor Dryer

to any kind of clay—tender or tough—for any kind of clay ware. No matter what your conditions are — no matter what your experience has been—no matter what anyone else tells you—just make up your mind to find out for yourself what the Proctor Dryer will do for you.

Our expert clay-drying engineers will go to your plant—they will give you a written guarantee as to what we will do—and you don't pay us if we don't make good.

Look up our rating—then ask us to come.

Philadelphia Textile Machinery Co.
Philadelphia, U. S. A. Hancock and Somerset Streets

"Samson
Interlocking Tile"
Patented

In the above cut a construction of Samson Interlocking Tile is shown, which is the most modern form of construction for dry kilns, refrigerators and small residences, as it is almost impossible for moisture, heat, frost or sound to strike through walls built in this manner.

The construction on the left shows a wall commenced at 21 in. and reduced to 9 in. This is an exclusive feature of Samson Tile.

SAMSON INTERLOCKING TILE builds any thickness of walls without the use of other forms of tile, those and other exclusive features make this the most modern building material.

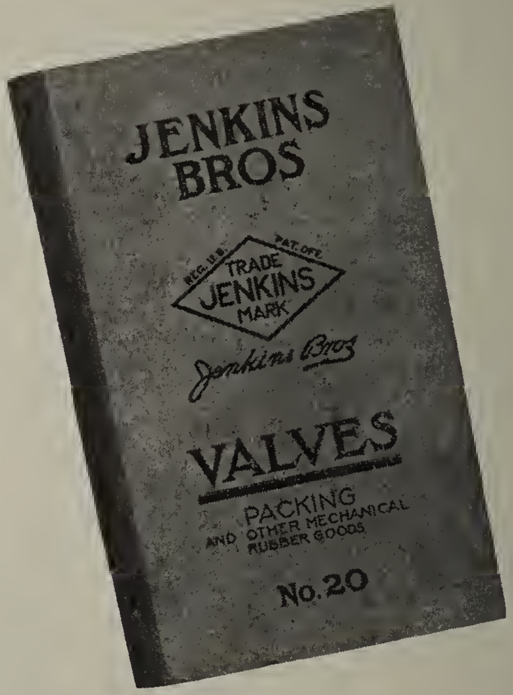
Three tests of SAMSON INTERLOCKING TILE, made at the University of Wisconsin, show respectively the following crushing strength: 1060, 1310 and 1040 lbs. per sq. in. This will give you some idea of the great load bearing capacity of "SAMSON INTERLOCKING TILE."

Write today for Manufacturing rights for unrepresented districts.

W. W. SMITH
Shallow Lake, Ont. Canada

the removal of the Jenkins disc from the disc holder, is shown in the valve. The disc, with the flattened hole corresponding in shape to the projection on the disc nut, is shown at point 6, assembled in the valve. If the disc and nut are assembled as shown and screwed into the disc holder, it will be impossible for the nut to unscrew without the disc turning, as the disc and nut are locked. It can be readily seen that by unscrewing the nut the disc and nut will come off together.

The Keyed Stuffing-Box is a hexagonal recess cast in the top of the valve bonnet, into which the packing is compressed by the waste nut. This keeps the packing and nut from turning when the valve is opened or closed, and thus prevents leakage around the spindle. It also holds the packing when the waste nut is unscrewed, so that it can be easily taken out to repack.



A Copy of This Catalog Will Be Sent on Request

All Jenkins Bros. Globe, Angle and Cross Valves can be repacked under full pressure when the valves are wide open.

All Jenkins Bros. Brass Globe, Angle and Cross Valves, standard pattern, are designed and guaranteed for a working pressure of 150 lbs., and are adapted for use in steam, hot or cold water, oil, air or gases.

Unless otherwise specified, valves are always furnished with discs suitable for steam pressure. Valves for cold water, air or gas pressure should be fitted with discs slightly softer than the regular disc for steam. When valves for special service are required, the conditions for which they are intended should be specified on order.

The metal used in the construction of Jenkins Bros. valves is of the highest grade. The valves are made with working parts of heavy design, and the metal is properly distributed to secure the best results.

All parts are standardized and perfectly interchangeable. Repairs on any Jenkins Bros. valves can be easily and quickly made, as any number of Jenkins Bros. valves of a given size and pattern can be taken apart, the parts mixed up and reassembled with perfect results.

Address Jenkins Bros. 80 White St., New York, N. Y., for complete information.

The "I-Rite" Pyrometer

The burning of clay products has always been more or less a matter of guess work as far as knowledge of temperature is concerned. The manufacturers of pyrometers have gone far in removing this factor. Some thermoelectric pyrometers properly installed and frequently checked give accurate measurements of the temperature at the *point of installation*.

Incredible results have been obtained by the old-time burner who burned by temperature color, because he judged the temperature of the brick at different parts of the kiln, not at only one point in the kiln.

Given always the same conditions of kiln, draft, weather, setting and uniformity of clay used—then the inability to reproduce results of a given burn is due solely to the lack of a permanent comparative color. The old-time burner obtained better results than another burner, only because he could better carry this comparative color in his mind, and he sometimes obtains better results today than the burner who operates his kilns by the more scientific method of thermoelectric pyrometers, because he duplicates by the eye at all sections of the kiln the temperature, which he has learned from previous experience to be the best.

Lack of uniformity of temperature in different parts of the kiln has been the great obstacle against obtaining uniformity of product. It is possible to carry a temperature of say 2,400 F. in one portion of a kiln, while in another portion the temperature may be only 2,000 to 2,100 F. From the one section first quality ware may be drawn and from the other "seconds" or worse—also the shades may vary greatly.

It is impossible to maintain the same temperature in all portions of the kiln, and this is especially true if there exists no means of knowing the temperature in each portion. A knowledge of the actual existing temperature is the biggest factor toward maintaining uniform intensity of heat. This is so generally recognized by the clay-ware manufacturers that time and again they have been heard to say: "If we could only measure the temperature not alone at the top, but on all sides, the bottom, and the center of the kiln." This wish has become a reality in the "I-Rite."

The "I-Rite" is a pyrometer which exactly duplicates the intensity of color of heated ware and at the same time indicates the temperature on an accurately calibrated scale. It is possible for the user to read the temperature of the ware under treatment within 1 per cent. to 2 per cent., regardless of the kiln temperature. The "I-Rite" immediately shows either that the ware is or is not up to the required temperature, and, in the latter event, how many degrees it must rise, in order to come up to the prescribed temperature.

An interesting experiment was carried on by Prof. E. L. Nichols, of Cornell University, to determine the sensitiveness of the human eye and its ability to distinguish shades of color. He placed 92 different shades of blue before 54 observers. The general average for placing these shades in the proper relation was over 95 per cent. The extent of this sensitiveness is further proven in the practice of medicine where the amount of hemoglobin in the blood is best determined by the "Hemoglobinometer," an instrument consisting of a graduated color with a calibrated scale to which is compared the color of a drop of blood.

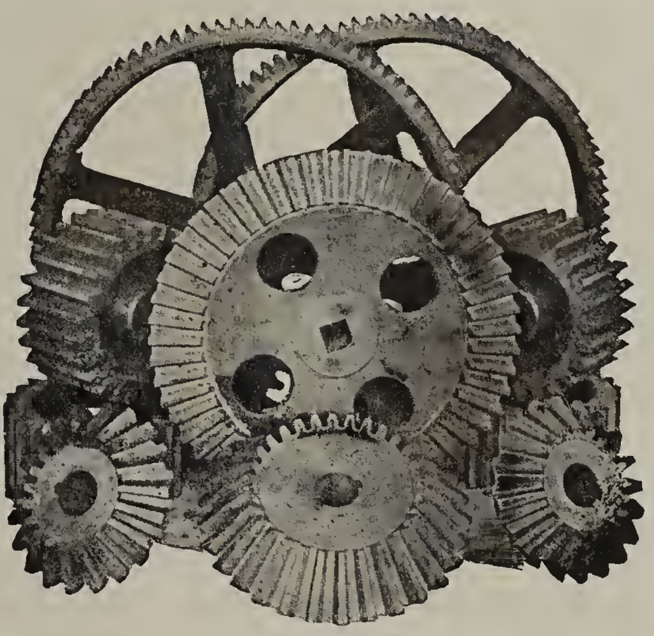
An interesting fact in connection with this sensitiveness is that a man who is color blind can read with the same facility as one who is able to distinguish color, for the reason that while the color may not appear as red or orange he is still able to duplicate the intensity, even though it appear green or blue. This sensitiveness of the human eye in color comparison is taken advantage of in the design of the "I-Rite," the principle of operation being the comparison of the intensities of colors.

The simplicity of the "I-Rite" is such that it can as advantageously be placed in the hands of the burner's helper as in the hands of the superintendent. In fact, it is especially designed for the man who at best can only read figures. The construction is such that it cannot get out of order.

The "I-Rite" is but 8½ inches in length, making it thoroughly practical to be carried in the pocket. Its accuracy, durability and extremely low cost should make it an instrument to be placed in the hands of every burner on the yard. Its operation consists in passing a wedge embodying the different intensities of color, taken on heated brick, over a diffused light. The diffused light assists materially in differentiating between the intensities. The intensities are carefully standardized so that each intensity of color accurately represents a definite temperature.

Walter A. Zelnicker Supply Company, St. Louis, in their bulletin 195, offer a lot of flat rails, practically as good as new, at low prices.

NUTTALL
Steel-Cut
GEARS
Point
the
Way
To Lower Power Costs

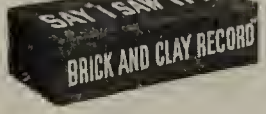


THE trouble with most clay products manufacturers is that they think of power cost only in relation to the fuel used or power equipment.

They overlook the fact that machines with cast tooth gears require from 25% to 35% more power to drive them than would be necessary with Steel Cut gears.

Let us send you some interesting and valuable data regarding this.

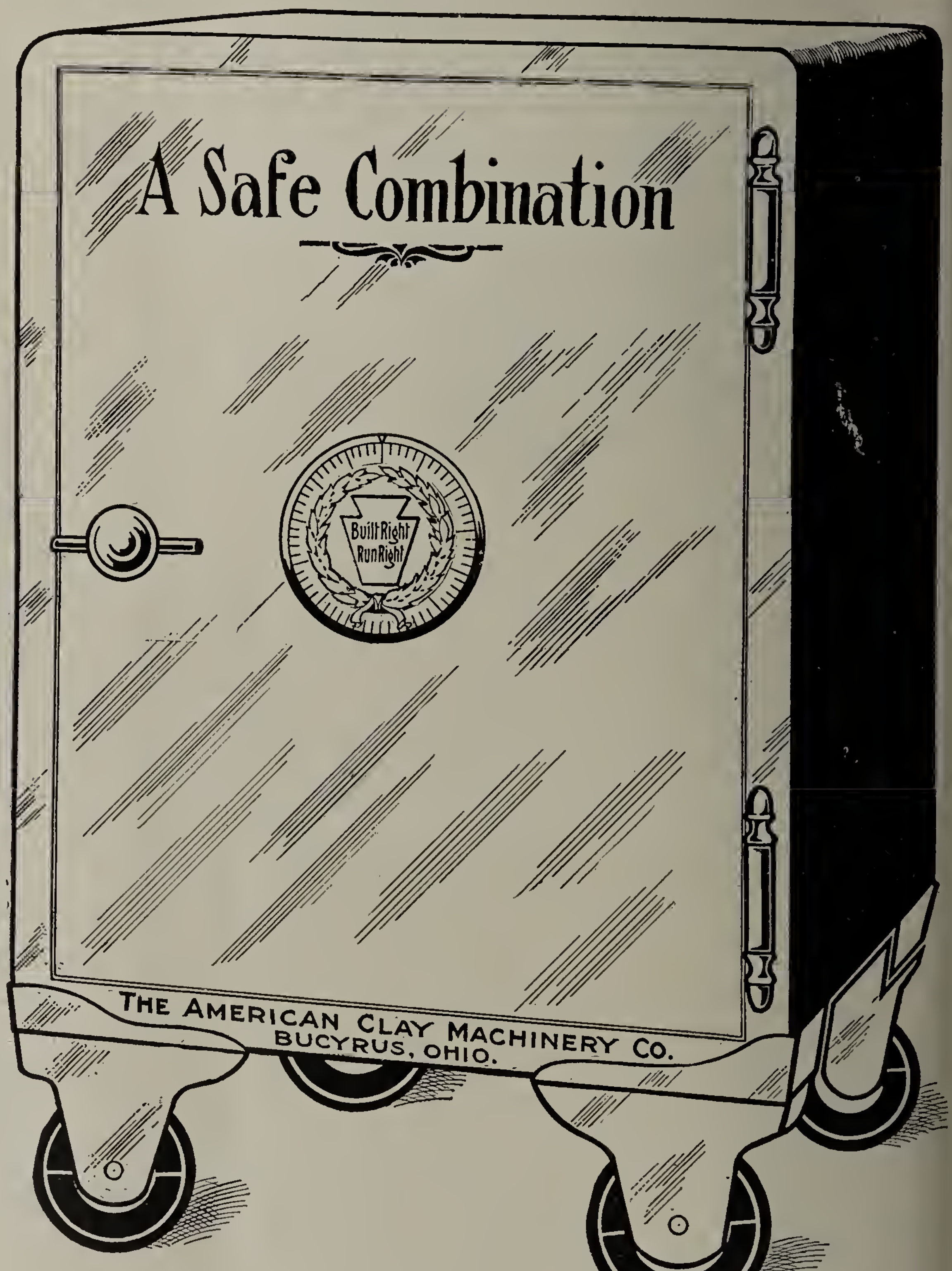
NUTTALL — PITTSBURGH
Ask for Bulletin No. 19



A Quality of Machinery Above All Others

The AMERICAN CLAY MACHINERY COMPANY
The Haigh Continuous Kiln
BUCYRUS OHIO
BUILT RIGHT RUN RIGHT

A "Safe" Investment


A Safe Combination
Built Right Run Right
THE AMERICAN CLAY MACHINERY CO.
BUCYRUS, OHIO.

A Safe Investment, if you want to save money, is a Haigh Continuous Kiln and a Waste Heat Dryer.

Here is a "Combination" hard to beat.

The Waste Heat Dryer saves all the waste from the cooling kiln and the Haigh Kiln saves a half of the fuel ordinarily used in other types of kiln and in addition it saves half of the labor.

This combination also insures a higher grade of product and a larger proportion of first class ware.

It will pay you to investigate this "Safe Investment" and this safe "Combination."

We have a catalog that tells of the merits of both Kiln and Dryer. We will be pleased to send you a copy on request.

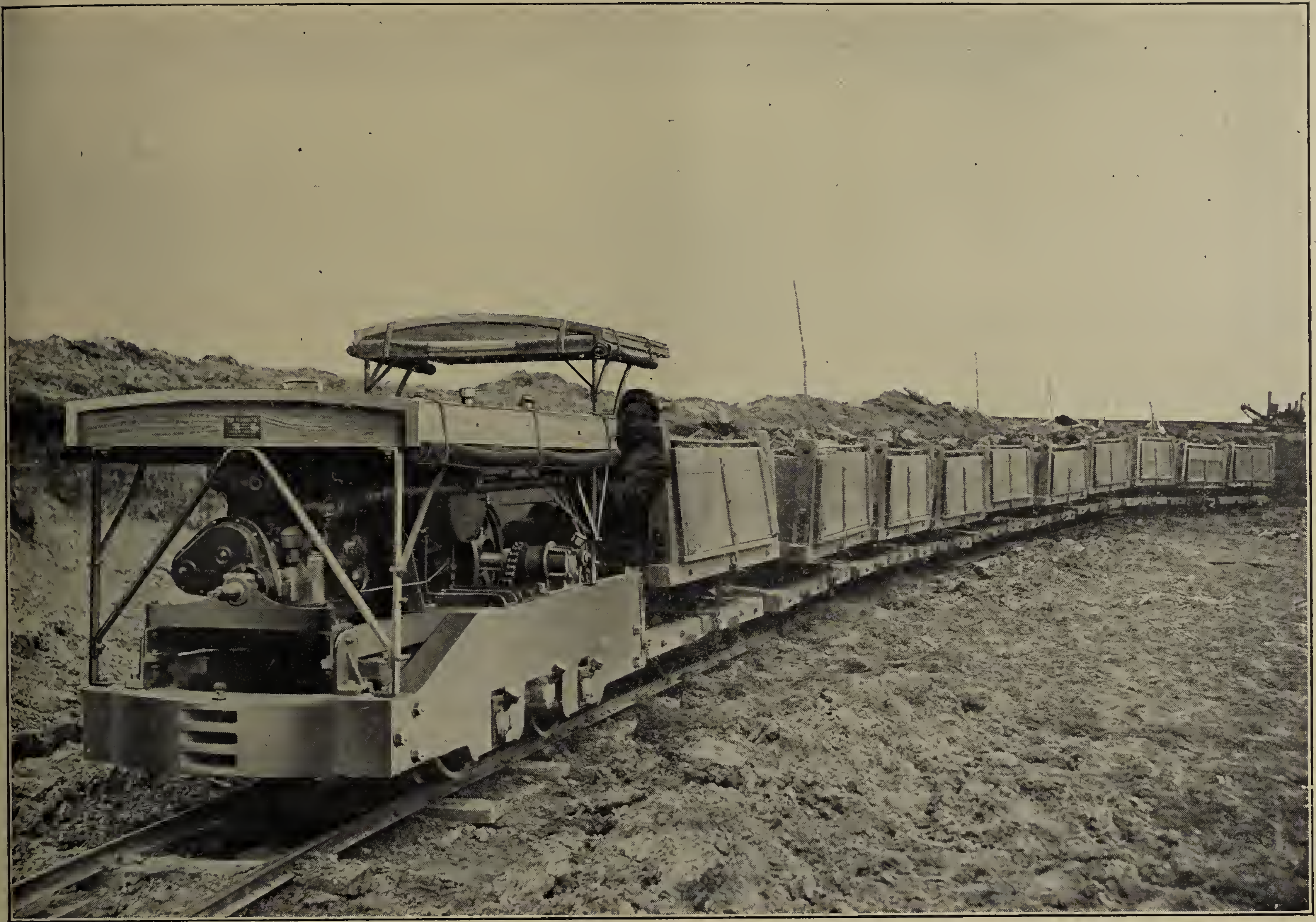
We build complete plants or furnish any unit, be it large or small.

Look for the July issue of The American Clay Magazine, it will interest you. If you do not get it regularly let us know and we will place your name on the mailing list.

The American Clay Machinery Co.

Bucyrus, Ohio

Largest Manufacturers of Clayworking Machinery in the World



Biglow Does His Haulage Cheaper

E. Biglow Co., New London, Ohio, has had a "Plymouth" Gasoline Locomotive in its clay plant for more than a year, "The Plymouth" replacing another make of gasoline locomotive.

Biglow says he is not only getting more WORK and BETTER work but that he is getting it done much cheaper

With
"The Plymouth"
Gasoline Locomotive

Mr. Biglow's experience is worth knowing—if you do hauling. Read what he says about "The Plymouth," and let it set YOU to thinking.

"We are not only doing more work, but better work with 'The Plymouth' than we did with our other gasoline locomotive and it is costing us less for fuel, less for labor and less for repairs—our repairs having been practically nothing in the year we have used 'The Plymouth.' We consume about five gallons of gasoline per day and 3-4 pts. lubricants. We consider the friction drive on 'The Plymouth' far superior to the old gear-driven transmission. There is nothing to wear out except the fibre rim, and we have used one of these four years. 'The Plymouth' is the best investment we have on our yards."

GET BOOK OF FACTS We have a big Book of Facts that tells all about "The Plymouth" and you ought to have a copy—it's free. It has pictures of "Plymouth" installations with actual records of each case, and some of these "Plymouths" are doing work identical with YOURS. Send TODAY for this FREE Book of Facts.

THE J. D. FATE CO., 240 Riggs Ave., PLYMOUTH, O.

The J. D. Fate Company
240 Riggs Ave.
Plymouth, Ohio.
Send us "The Plymouth FREE Book of Facts." This does not obligate us in any way.

(Firm Name) ....
(City) ....
(Street) ....
(State) ....

SAY I SAW IT IN BRICK AND CLAY RECORD

What ADAMS EXPRESS thinks of KELLY TRUCKS

KELLY

THE Adams Express Company originally purchased, after the most thorough investigation, sixteen 3½ ton Kelly Trucks for use in New York. They soon followed this up with an order for another ten of the same tonnage. Then two more were ordered for Toledo and two more again for New Haven.

An efficient local delivery system is essential to the best success of an express company. Service must be prompt, reliable and always available.

That the Adams Express Company was satisfied — that Kellys showed they could make good under the most exacting conditions—is certainly proved by these re-orders.

The Complete Line
Worm Drive—1½ and 2½ tons.
Chain Drive—1½, 2½, 3½, 4, 5 and 6 tons.

"Like Kelly Does" FREE

We want to put your name on the free list of this valuable monthly publication devoted to truck transportation (not all Kelly). Full of useful information for all truck users—whatever the motive power.

The Kelly-Springfield Motor Truck Co.
1206 Burt Street, Springfield, Ohio

KELLY TRUCKS

BRICK and CLAY RECORD

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Vol. XLVIII, No. 12 Chicago June 20, 1916

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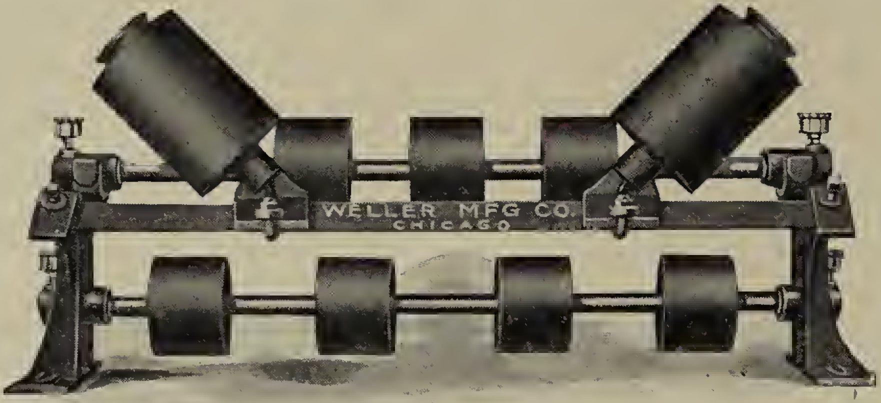

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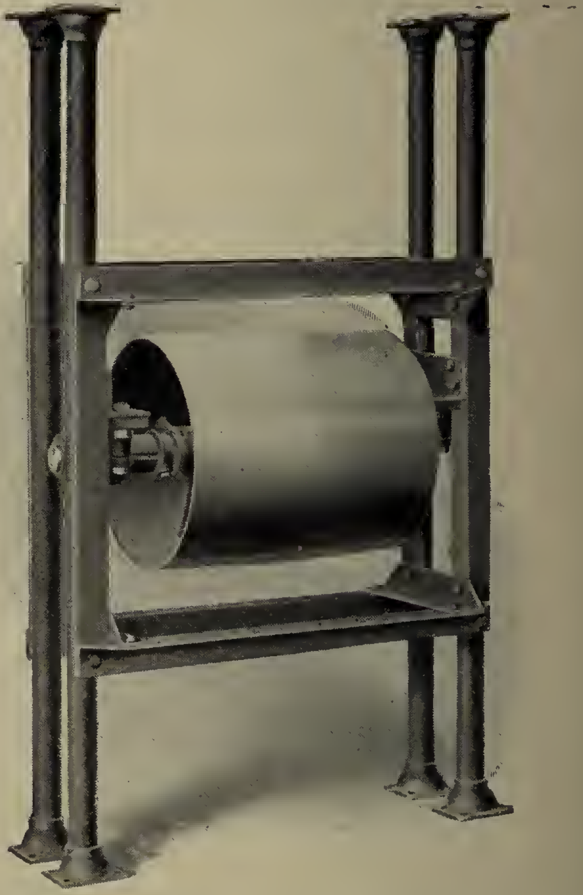

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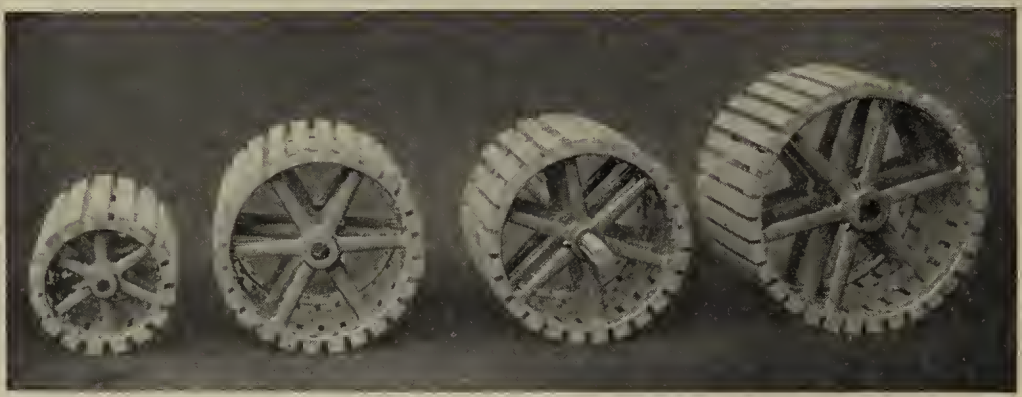

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BRICK and CLAY RECORD

Entered as Second Class Matter January 2, 1911, at the Post Office, at Chicago, Ill., Under the Act of March 3, 1879.

Terms of Subscription
One Year—(24 Numbers)
United States......$2.00 Foreign $3.00
Single Copies.......25c

Published the first and third Tuesdays of each month by

Kenfield-Leach Company
445 Plymouth Court Chicago

Chicago, June 20, 1916
Vol. XLVIII No. 12

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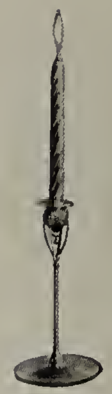
The publisher of a business paper should dedicate his best efforts to the cause of Business and Social Service, and to this end should pledge himself: 1. To consider, first, the interests of the subscriber. 2. To subscribe to and work for truth and honesty in all departments. 3. To eliminate, in so far as possible, his personal opinions from his news columns, but to be a leader of thought in his editorial columns, and to make his criticisms constructive. 4. To refuse to publish "puffs," free reading notices or paid "write-ups;" to keep his reading columns independent of advertising considerations, and to measure all news by this standard: "Is it real news?" 5. To decline any advertisement which has a tendency to mislead or which does not conform to business integrity. 6. To solicit subscriptions and advertising solely upon the merits of the publication. 7. To supply advertisers with full information regarding character and extent of circulation, including detailed circulation statements subject to proper and authentic verification. 8. To co-operate with all organizations and individuals engaged in creative advertising work. 9. To avoid unfair competition. 10. To determine what is the highest and largest function of the field which he serves, and then to strive in every legitimate way to promote that function.

The EDITOR'S CORNER

Comment, Criticism and Advice on Live Issues Affecting the Manufacture, Marketing and Manifold Uses of Burned Clay Products



IT IS REPORTED in Washington that the Federal Trade Commission, following the example set by the Interstate Commerce Commission, will rotate the chairmanship, thus giving an opportunity to every member of that body to sit in the seat of power for at least one year. This being the case, the new chairman of the Federal Trade Commission will be Edward N. Hurley, the present vice-chairman.

For those who know Mr. Hurley, or have read of his activities in behalf of business in the heretofore icebound precincts of the national capital, no further introduction nor word of explanation is necessary. We believe that those who know him best, will join with us in congratulating Mr. Hurley on his reported advancement. For those of our readers who are so unfortunate as to never have heard of him, we refer them to our editorial on page 212 of the May 2 issue which goes into detail regarding some of his work.

However, another rumor, contrary to that above mentioned, seems to have "gone the rounds" recently in Washington to the effect that, following President Wilson's expressed desire, the present chairman of the Federal Trade Commission will remain at its head, and this being the case, it is more than likely that Vice-chairman Hurley may tender his resignation to the President and ask to be relieved of his duties as a member of the Commission.

It is certainly to be hoped that no such action as that last mentioned will take place and that those in power will take the necessary steps to prevent it. Vice-chairman Hurley's co-operation in industrial association work has been so valuable that his retiring from the Federal Trade Commission might well be called a national calamity.

Worse than War

A SERIOUS SITUATION—to say the least—is presented in the refusal of the railroad employes to submit their demands for an eight hour day, without corresponding decrease in pay and for increased compensation for excess service performed, to arbitration.

Regardless of whether the railroad employes can afford a strike, or the railroads—both of which are exceedingly doubtful—the public certainly cannot, and should take immediate steps to see that it is not called upon to make this unnecessary sacrifice. A strike of this kind at this time, as one large metropolitan newspaper puts it, would "be more disastrous to America than ten wars with Mexico."

The National Chamber of Commerce has already taken steps to see that the interests of the business men of the country are not without a voice in this critical situation. Thru a joint resolution endorsed by a referendum that received the largest vote ever cast by the affiliated organizations of the National Chamber, the Interstate Commerce Commission will be asked to report to Congress as soon as practical upon wages paid with hours of service to each class of railroad employes and other information pertaining to the controversy.

If the railroad employes are determined to sacrifice the nation to their selfish interests by continuing in their refusal to submit to arbitration, and call a general strike, the public will have to intervene in its own behalf. There is little doubt but that every right-minded citizen wants to see justice done on both sides, but he certainly is not going to submit to the prospect of starvation and business stagnation, without throwing whatever influence he has toward effecting a peaceable settlement of the dispute.

Congress can empower the Interstate Commerce Commission to act so as to prevent this threatened tie-up. It should be made to feel that it is its duty to do this, and to do it without delay.

If there ever was a time for citizens, especially those who have capital invested in a manufacturing enterprise, to write their Congressmen, it is now. The National Chamber's resolution, good and effective as it may be, should be backed up by individual demands for action. There is nothing that makes a Congressman act with greater celerity than a strong sentiment from "back home."

Clean Up the Yard

"CLEANLINESS is Next to Godliness" has been handed down to us from preceding generations in much the same way as "A Stitch in Time Saves Nine," and other homely, but nevertheless wholesome truths. Probably the first time that we heard the first-mentioned of the above sayings was when a very small boy, during the process of having our faces washed, especially around the ears. Then Mother would repeat it as sort of an encouragement to a higher plane of living, while having some of the dirt removed from our physiognomy.

There are a good many clay plants that need to have their "ears washed" in the way of a general cleaning up around the yard.

Every Spring sees a return of the

"Clean-Up Week" movement which extends to municipalities both large and small. The result is a cleaner, brighter and more sanitary community wherever the suggestion of "Clean Up" is faithfully followed.

This movement might well extend to those establishments engaged in the manufacture of burned clay building materials. As one travels around the country, one sees a great many different kinds of plants. Some are slovenly in appearance, piles of bats and other junk around the kilns, broken barrows and miscellaneous scrap scattered promiscuously about the yard. On the other hand there are many plants that take a keen pride in keeping the premises neat and clean at all times.

Of course, the objection might be raised by some that it is a useless expense to keep the yard in shipshape condition in season and out, and that a clay plant was never meant to be clean, anyway. The point of expense would soon fade into insignificance if the premises were given one good, thoro cleaning and then a little time put into the matter of keeping the yard clear of debris every day or every week. This would not be expensive and would be a means of creating a good impression upon visitors—at those plants where visitors are welcome. Regarding the second point, we have nothing to say, except that a man's plant reflects his personality.

Lastly, there is one consideration that stands above all others in this matter of cleanliness. It is the mental effect that tidy surroundings have upon the workman. Environment exerts a powerful influence over people. "A Man is Known by the Company He Keeps," follows very much along this same line. You cannot expect a workman to think clearly, be energetic and ambitious when all about him are the evidences of filth and carelessness.

As an inspiration to the men in your employ, clean your yard.

The Glorious (?) Fourth

THE APPROACH of Independence Day is looked upon with a certain amount of horror by those citizens who have the public weal most at heart—a dread that mars what should really be a stirring and joyous occasion for every patriotic man, woman and child.

This blot on the greatest of all national holidays is well pictured in a recent bulletin issued by the National Fire Protection Association, as the Grim Reaper in the inky cloak of the "Murderous Fourth" knocking with his bony hand upon the door of the peaceful American home.

The picture is not overdrawn. On the other hand its truth is well borne out by the fact that in the past thirteen years a total of 43,951 persons was killed or injured in the celebration of the Fourth of July.

Hardly less serious than this astounding toll of life and limb is the amount of property destroyed in that period by fires whose origin can be traced directly to the insane celebrations that have held sway in years past.

"It is, perhaps, too much to expect a complete return to sanity," says the bulletin, "but some effort at least may be made by all cities and towns toward leading their people into more moderate and more intelligent forms of celebration. If explosives must be used the authorities can limit their use to the public parks during certain hours of the day, where the folly-hunters may kill and maim themselves and each other to heart's content, without injuring other people, or destroying property by fire. "The firing off of explosives among the closely built shingle-roofed frame houses, which compose the greater part of our cities, is wholly in accord with the reckless spirit of Americans regarding fire."

Much of the "sane Fourth" agitation may seem overdone to those who live in the large cities where, in most cases, adequate legislation has removed the hazards of the day, but there is still room for considerable work in the smaller towns of the nation in advocating stricter regulation of the sale and use of firearms and so-called "harmless" fireworks with a view toward reducing, if not eliminating, the greater part of the needless waste of life and property in the celebration of the birth of Our Country's independence.

A Valuable Lesson

A RECENT ISSUE of "Engineering News" contains an editorial in which there are some thoughts worthy of careful study on the part of paving-brick manufacturers and those interested in the progress of dependable highways. This editorial has for its subject "Highway Foundations and Motor Trucks," and outlines, in a brief way, the history of Massachusetts' experience in road building. The facts which are revealed therein should prove good ammunition for the forward drive of permanent roads enthusiasts.

The Bay State has been a pioneer in highway improvement, having built many miles of what were considered good roads at the time. However, during the past winter these roads have suffered, in many cases, very serious damage by motor trucks and motor omnibuses, vehicles actually going thru the road crust and sinking to their hubs, making many of the highways look like plowed fields.

Some of the older roads in the state have heretofore always carried the traffic satisfactorily and it has only been within the past year or two that they have failed to meet the test of newer and heavier traffic.

Massachusetts is now facing a difficult problem. It has built about 1,100 miles of state highways, which are now in need of extensive repairs, the cost of which is far beyond the appropriations available for this work. It is now thought that the state will be compelled to turn to some more permanent form of paving than water-bound macadam.

Should not the experience of Massachusetts be a valuable lesson to every municipality, county and state that is contemplating the improvement of some of its streets or roads? The work of paving these highways will, for the most part, be paid for with borrowed money which, in turn, will have to be paid with interest by the coming generation. Is it fair to the citizens who must follow to invest their money in improvements that are sure to "crumble to ruin, and moulder in dust away," long before the expiration of the bonds?

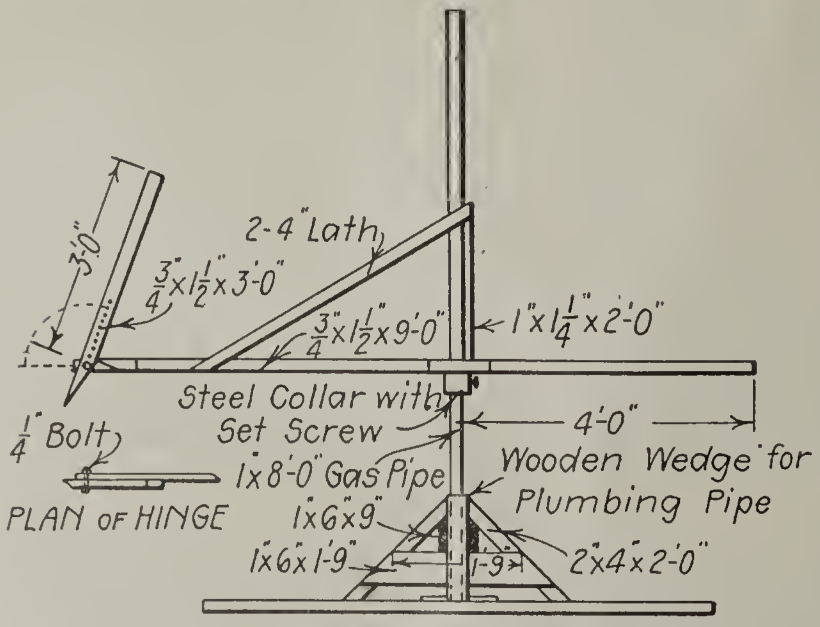
HOW *to* BUILD *a*

Some Brief Instructions for the Man on the Plant
This Important and

A Pair of Well-built Hollow-tile Silos on an Indiana Dairy Farm That Is a Credit to the Place

BEGINNING at the foundation, which is the proper starting point, we should say that, after a suitable location has been found, the next step would be to look into the drainage of the site.

Drainage is of great importance and should receive more consideration than is usually given it in the construction of farm buildings, and especially of masonry silos. Any soil will support a greater load when dry than when wet. This is especially true of clay. The heaving action of frost is due entirely to the moisture contained in the soil which expands with an almost irresistible force upon freezing. These considerations alone would be sufficient reasons for a well-drained site which can be secured by placing drain-tile at the bottom of the circular excavation for the foundation. A line of tile should then be placed leading away from the site to a proper outlet.



The Guide Which Makes Certain That the Silo is Round all the Way Up

Having provided for drainage, the next step is to consider how the foundation will be built. For the hollow-tile silo, two types of foundation have been found to be satisfactory. In one, concrete is the principal constituent, while the other is largely made up of hollow-tile. In building the first-mentioned type, it is necessary to erect forms into which the concrete is poured. This foundation usually is from three and one-half to five feet deep and extends about one foot above the grade line.

HOLLOW TILE MAKES A CHEAP FOUNDATION

Incidently, the building of these forms entails considerable expense. This cost can be materially reduced by using hollow-tile almost entirely for the foundation, as in the second type above mentioned, provided hard, impervious blocks are selected for this purpose—blocks which will not absorb moisture readily. However, in using this type care must be taken to see that adequate drainage is provided as the blocks might fill up with water, freeze and burst. If the suggestions which have already been made regarding this point are followed, there need be no fear regarding the efficiency and suitability of this kind of a foundation.

FLOOR MAY ALSO BE LAID WITH TILE

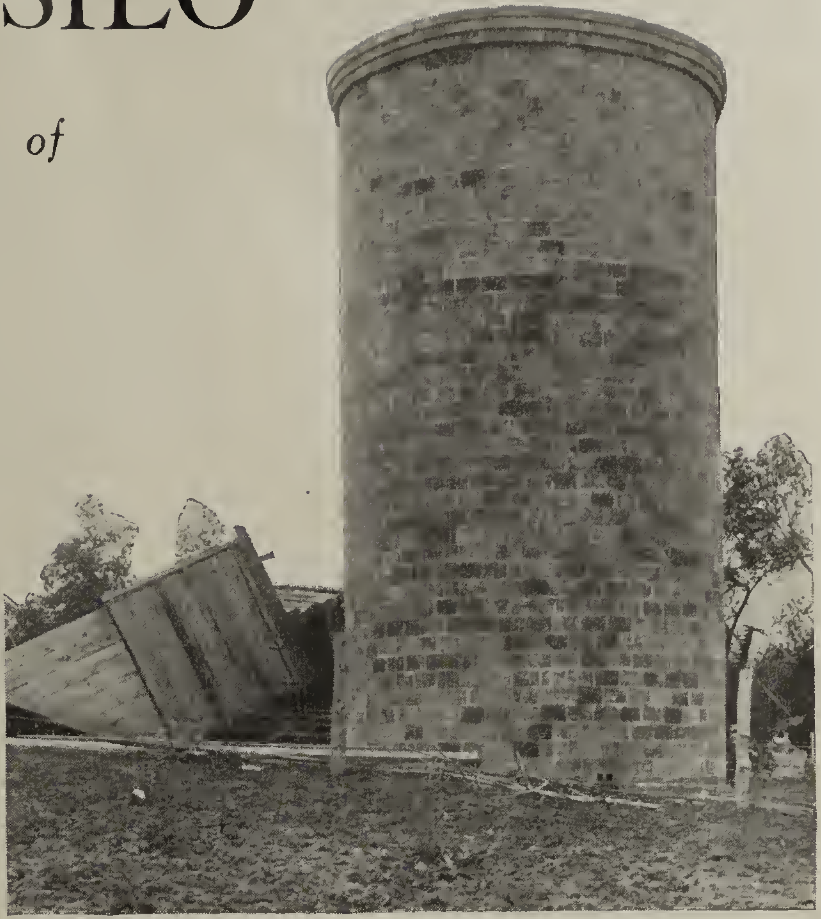
The floor, in the case of the concrete foundation, is made of concrete, usually four or six inches in thickness. This floor, as well as the side walls of the foundation, are smoothed off carefully, the latter especially so that there will be no projections to interfere with the settling of the silage. In the hollow-tile foundation the floor is built of hollow-tile. Care should be taken to see that the side walls are smooth and well laid. A one-half-inch coat of neat cement is usually spread over the hollow-tile floor, while a wash of thin cement is placed on the side walls to fill up any inequalities.

Now that we have a good foundation, let us proceed

HOLLOW TILE SILO

Who Would Know More About the Use of Profitable Product

Those Who Have Met with the Greatest Success in the Marketing of Silo Tile Have Found That it Pays to Follow the Material to the Job and Supervise the Erection of the Silo, Charging, Perhaps, a Small Fee. The Following Article was Written by the Editor of this Magazine and Published in "The Farming Business," as a Guide to Farmers Contemplating the Erection of a Silo, and Should Fill a Similar Mission to the Manufacturer.



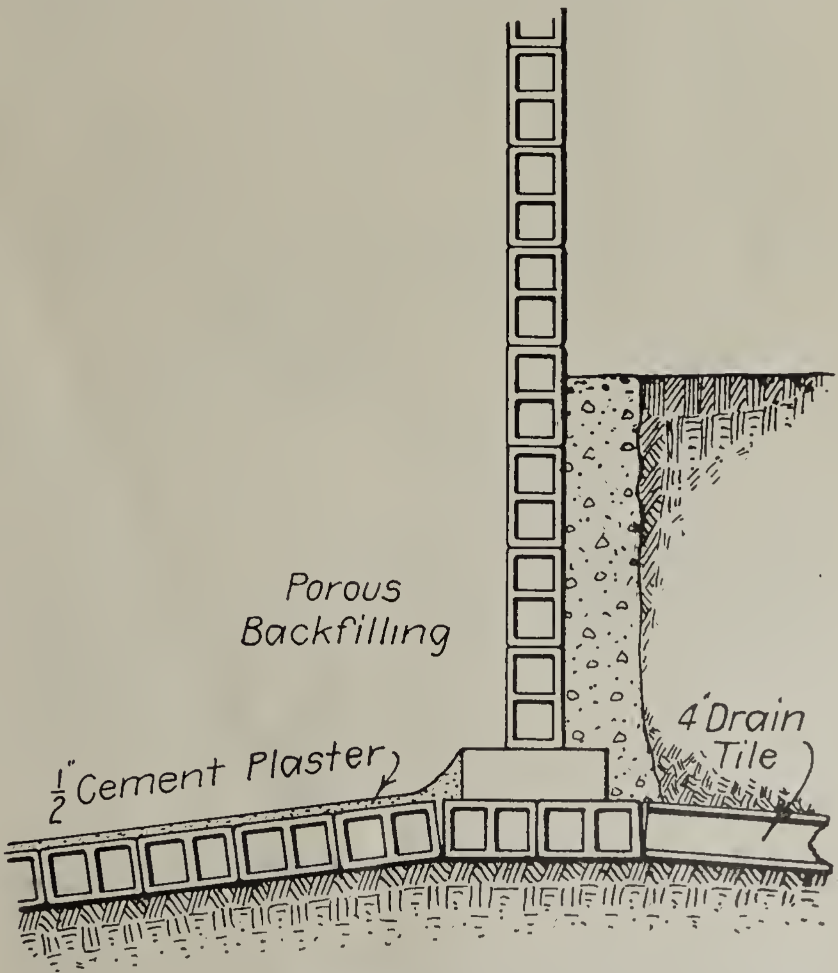
Standing Up in the Face of a Terrific Tornado is No Common Feat, Especially While Buildings All Around Are Going Down. This Silo, However, Stood theTest —a Tribute to Its Builder

to build the walls of our silo. Hollow-tile, when properly laid, makes an air-tight silo—a million gallon jug—an absolute barrier to the entrance of air to the body of the silage. Hard-burned tile will absorb less moisture than any other building material. It is not a porous material. Practically no moisture is transferred thru a wall of this kind and so it makes a very good silo, absorbing none of the life-giving juices from the silage, thus preserving it long and in a very excellent state.

As the majority of our readers are aware, most silo blocks are curved to a radius so that when laid end to end they form a complete circle. Blocks of this kind lay up more rapidly and give a better job than do straight blocks. The wall is smoother inside and out which is of obvious advantage, first, for the preservation of the silage on the inside and second, for the outward appearance. Blocks of different dimensions are used for silo work, most of which have a thickness varying from four to six and in some localities, eight inches. They are very strong, being capable of carrying a load of seventy-five thousand pounds before breaking.

STEEL REINFORCING INSURES AGAINST BURSTING

In order to insure against the bursting of the silo due to pressure from within, which is usually about eleven pounds per square foot of wall surface for every foot in depth, a steel reinforcing is used in the hollow-tile silo. This may be a light steel band which goes about the structure and fastens in the door jambs, or a quarter-inch round steel wire or rod may be used for this purpose. In the case of the Iowa silo, which was originated and designed by the Iowa Experiment Station at Ames, the most convenient reinforcement has been found to be a hard No. 3 steel wire, which is laid in the mortar joints between every course. The size of the wire or steel used is less than the thickness of the mortar joint; therefore, it does not interfere with the laying of the tile and, by placing it in the joint, it is thoroly protected from rust. The radial cut silo blocks are provided with grooves in which the steel reinforcing may be laid instead of in a smooth mortar joint. The mortar used for this work is usually composed of cement, lime and sand. The sand should be medium fine. A certain amount of lime is necessary as cement mortar is not plastic enough to stick



Sectional View of the Floor, the Foundation and the Silo Wal;

to the ends of the blocks when applied. No more lime should be used than necessary to make the mortar workable. Most tile silos have reinforcing four times as strong as required, not taking into consideration the strength of the tile or the cement mortar.

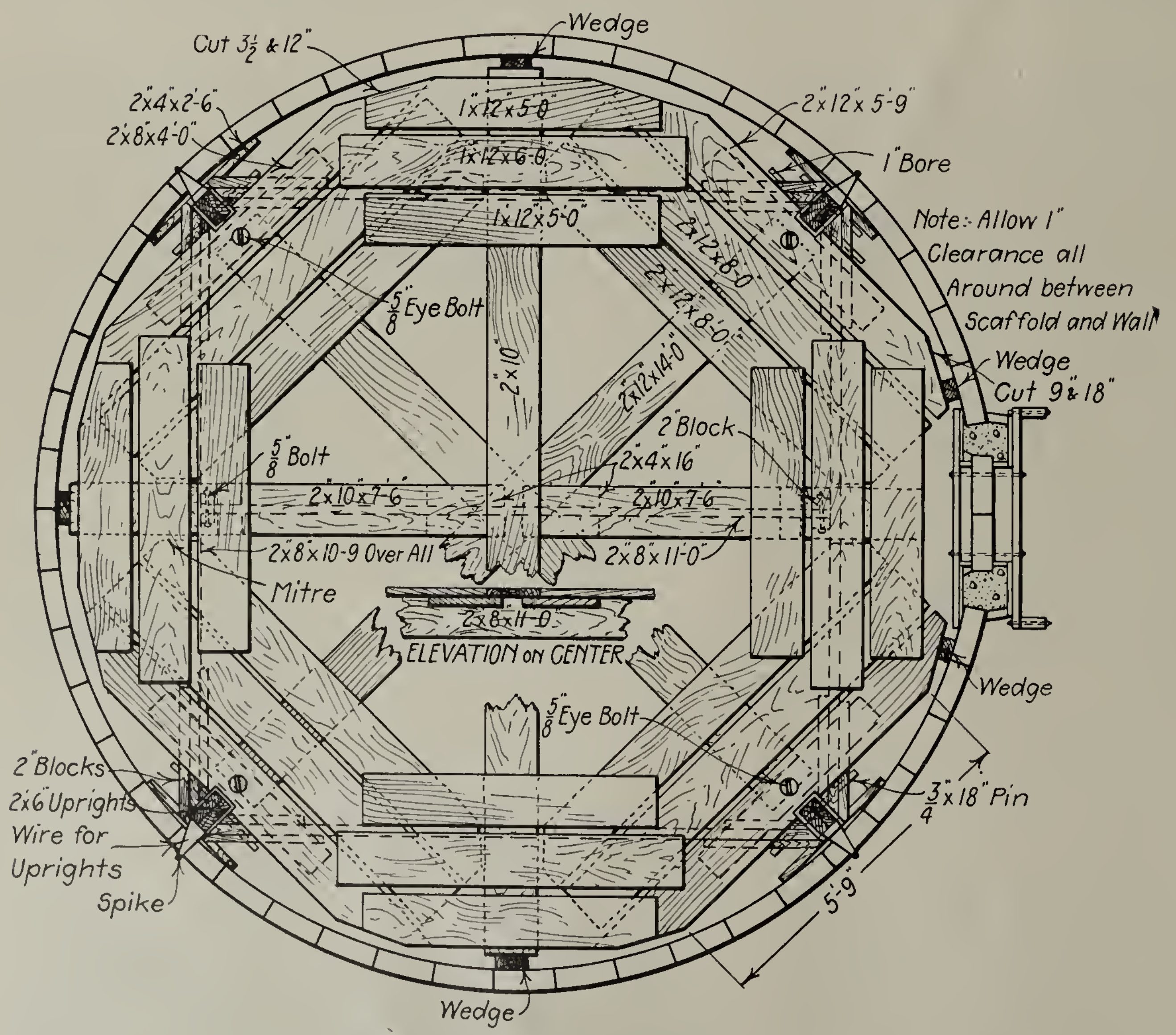
There is great danger in erecting a hollow-tile silo without using the proper reinforcing. Some have learned this lesson at a great expense. No reputable manufacture will allow anyone to put up a silo without reinforcing it and the farmer is particularly warned against committing this error.

Simplicity is the keynote of the hollow-tile silo. Any mason who lays a brick can build one. The following method of laying the wall may be only one of several practical methods, but it has been followed successfully several times. The first course of blocks should be spaced around ⅛ or $\frac{3}{16}$ of an inch apart without mortar in order to determine the proper diameter of the silo, the width of mortar joint necessary and the length of the guide. This will overcome the necessity of cutting blocks.

Where straight blocks are used, the steel should be placed upon the outer half of the courses in order that there shall be enough mortar inside to bear against the wire and hold the blocks. Loose blocks may be placed temporarily upon the wall to hold the steel in place at intervals of six or eight feet as occasion requires.

AN UNUSUAL TYPE OF SCAFFOLD

The scaffold used in building hollow-tile silos is somewhat different from that used in ordinary building construction, first, because it is circular in shape and second, because it is movable. This scaffold, a plan view of which is shown in an accompanying illustration, consists primarily of a wooden platform. This platform moves on four upright posts which are secured to the wall of the silo at points approximately equally spaced. These posts support the scaffold by means of ¾-inch round steel pins, sixteen inches long, extending thru one-inch holes in the uprights. Eight of these are required as one set should not be removed from a lower hole until the other pins are placed to support the scaffold in case any of the hoisting device should break.



A Plan View, Together with Dimensions, for the Scaffold Platform Used Inside the Silo. This is Better Than Having the Scaffold on the Outside

A CLEVERLY DESIGNED WALL GUIDE

In laying any straight masonry wall, a line may be used as a guide for securing a properly shaped wall. In the case of a circular wall this is manifestly impossible. Here the need of some sort of a guide is even greater than is the case with a straight wall as the eye of a mechanic cannot be trusted to determine a curve as he would a straight line. In the silo it is essentially important for the sake of appearance, preservation of the silage and strength of the wall, that it shall be circular and plumb. It is highly desirable that a guide should be simple, easily used and in the way as little as possible when not in use. It is, of course, possible to build a wall circular by starting the circle then using the plumb at intervals on the wall. However, the guide which has been devised has been found better for this purpose by men who have tried both ways. A sketch of this device is shown on a preceding page. It is also advantageous, since by means of it, the owner of the silo may in a very few moments detect any faulty shape of wall. It is merely necessary to determine the proper position of the scaffold by means of a plumb-bob, then follow the end of the guide around the wall. All blocks should be within less than ½ or ¾ inch of the guide and even these variations should be gradual so as not to form shoulders in the wall.

While many farmers prefer a concrete door frame, experience has proved that hollow-tile door jambs filled with concrete and steel are entirely successful. Some manufacturers furnish these jamb tile which can be easily laid by the mason on the job. In addition to the wire reinforcing in every course of the hollow-tile silo, twisted steel rods are used to form a bond across the door, being placed about every six courses and extending well into the wall, or are secured to vertical steel rods at the doorway to which the reinforcing is secured.

When the last course of tile has been laid on the silo the structure is then ready for a roof. This may consist of framing covered with sheeting and then shingled; it may be built of reinforced concrete, as many of these roofs are; but better than these, a clay tile roof, a number of which have already appeared in the Middle West, may be used.

PAYING HIGH WAGES

How One Plant Has Solved the Labor Problem, Maintaining Maximum Capacity and Lowering Costs in the Face of an Increased Wage

By H. R. Straight

Superintendent, Adel (Ia.) Clay Products Company

A WORKMAN in this day and age, in order to be a satisfied and an efficient employe, must, with a few rare exceptions, be well paid and be able to at least live with a fair degree of comfort. With the narrow margin of profit that the average clay plant owner is at present enjoying it is not possible to pay the wages usually conceded to skilled labor unless the men on the plant use their heads as well as their hands to "boost" the output of marketable ware. In order to accomplish this last-mentioned point, it was felt necessary by the writer several years ago, to plan some system of paying wages according to the results obtained.

However, satisfactory results can only be realized in a manufacturing plant such as was operated by the writer, by securing the following four primary conditions:

(1) The workman must know that the employer, in order to pay "top notch" wages, must be able to rely upon the workman's presence at work every day and that when he is not present, his absence will be felt by the entire plant to some extent.

(2) The co-operation of workmen must be such that they will do all in their power to make each and every piece of ware they handle of such quality that it will go out as No. 1.

(3) The workman must be made to feel that for each piece that he fails to handle as above mentioned, at whatever stage of the process it may be, when he is supposed to be lending his support to the steady output of his department, his wages will be affected to a certain extent.

(4) Every man on the plant must understand as thoroly as possible that for the employer to be able to pay a premium wage, the output must be up to a certain point to cover the overhead and ordinary running expenses, and that if he (the workman) is not paid a premium it is because the employer is not making any return on his investment.

With these conditions in mind and with the cause of failure of a number of bonus systems at hand, I set out several years ago to design a premium payment wage system that would be so simple that the ordinary workman could easily understand it, but that would also have the rules laid down so plainly that for every detail that might come up in the future there would be a rule which the workman himself could apply without coming to "headquarters."

NO EXCUSES FOR ABSENCE ARE ACCEPTED

My first decision was that the rules must be such that absolutely no excuses, regardless of whether or not they were really legitimate, must be accepted. This particularly applied to absence which might affect, according to the rules, the premium paid the workman. In several cases it was found that there had been bonus systems tried where a legitimate excuse had been accepted but it was found that it did not take long to invent "legitimate" excuses and present them in such a plausible manner that the employer generally accepted them. Of course, it would become known sooner or later, by the employer in a good many cases and by the employes in most all cases, that many excuses should not have been accepted and the result was trouble and dissatisfaction, leaving the employer at a loss to know what to do. This usually resulted sooner or later in a change of the wage system to the detriment, at least, of the employer.

It is, therefore, plain that the only way to figure the correct premium a man should be paid is according to the hours which he actually puts in and this was made an iron-clad rule, worked out in the following form.

RULES COVERING LOSS OF TIME

A man could lose ten hours or one day of time a month without surrendering any part of his premium. If he lost more than one day and not more than two days he would lose one quarter of his premium. If he was away more than two days and not more than three, he must give up one-half of his premium. A loss of more than three days resulted in the surrender of the entire premium he might have received for the month.

In the case of burners, or any one putting in more than a few minutes extra time for oiling up and such work, an additional bonus must evidently be allowed because of the fact that these men contribute more time to the making of a certain tonnage of finished ware than those who are working only a day of eight, nine or ten hours. The bonus is, therefore, proportioned to such men according to the number of hours per month that it is necessary for them to work and they were allowed to lose one day more on the same percentage of deduction where they put in over twenty-five per cent. more than the ordinary workman. In other words, a burner that works twelve hours per day and seven days in the week puts in a little over thirty per cent. more time than a man working only six ten-hour days and accordingly, his percentage of the bonus, if he lost no time over the two days allowed, should be one hundred and thirty per cent.

HOW THE BONUS IS COMPUTED

The bonus in our particular plant was started on a 1,200 ton per month basis and twenty-five cents per ton was put into a general fund until 1,500 was reached. From 1,500 to 1,800 tons fifty cents per ton was added; from 1,800 to 2,500 seventy-five cents per ton was added and from 2,500 tons up one dollar per ton was paid. In only two cases during the four years in which the plan has been in operation, has the tonnage fallen to 1,200 tons, which were in the winter months, when operation was very difficult. In a few cases we have made over 3,000 tons which, for the capacity of the plant, we consider very good. Under the conditions which we operate, the labor cost per ton at 3,000 tons has always shown up less than at 2,000. It is very easy to see that with the number of men employed in a plant making about 2,500 tons the greater tonnage made a very attractive object for the men to work for and, with the number of tons increasing as the overhead is naturally cut off, it is no hardship on the employer if the bonus paid the men that work steady (losing not over a day a month) amounts to a wage of $3.00 per day of ten hours. In this way the standard of men employed is also raised.

FOREMEN RECEIVE ONE-FOURTH MORE THAN MEN

It was evident, of course, in planning the system that the foreman who is expected to take the lead and upon whose efforts, more than upon the efforts of the ordinary workman, a high tonnage depends, should receive a greater bonus than the ordinary workman. Accordingly, it was decided that he be paid a percentage one-fourth higher than his men, but if the foreman lost more than the three days allowed he could not share in the bonus. He also lost the one-fourth additional bonus.

By allowing the foreman an additional bonus, it was looked upon by the ordinary workman as an extra incentive for him to become a foreman, the result being a subconscious effort on the part of each workman to fill the foreman's place. This results, of course, in each workman being an understudy to the foreman under whom he is working and it has been especially noticeable that the absence of the foreman has made only a little difference on account of the man next in order being able to step up to take his place.

It was found that in many cases men who were compelled to be absent could secure a workman outside of the plant to take his place while he was gone and where such workman was furnished entirely by the efforts of the absent workman with the approval of the superintendent or general manager, no deduction was made from the absent man's monthly bonus. This rule overcame to a large extent a loss of output due to a vacant place in any gang and, since during the greater part of the year there was a waiting list of workmen, all gangs were kept at a relatively high standard of efficiency.

EVERY WORKMAN STRIVES FOR NO. 1 WARE

Since the bonus is figured only on No. 1 finished ware actually on the yard or in cars ready for shipment, there is naturally an effort on the part of every workman to prevent anything in the way of second grade material being made. Those in the department where the molding is done, use the necessary care to make each piece a No. 1 salable article. The man handling the drier naturally keeps uppermost in his mind that he must use care to avoid spoiling the ware by too rapid drying, as such a thing of course is possible in most hollow-ware plants. The men setting the kilns realize that if a damaged piece of ware is allowed to pass at that stage that it could not come out as first class material and, therefore, unusual care is taken to avoid setting bad ware. The burning was naturally watched more carefully. Those drawing the kilns were made to feel that greater pains must be taken in loading the material in order to keep the employer's customers satisfied so that there would be a steady demand for the material. Of course a saving in labor is made and a higher tonnage realized on material which goes directly into the cars instead of being piled on the ground and afterwards picked up and loaded. Those drawing the kilns are also made to feel that, while they are not directly benefited by the sale of whatever seconds are unavoidably manufactured, yet they can be sold by the employer and are a means of revenue which goes to help pay the bills.

It soon became evident to all the workmen that where extra labor was required, not only the employer had to pay this extra labor the basis wage but the employe had to share with extra workman a part of his bonus which, of course, cut down his monthly earnings. It was easy for the workmen to realize that anywhere around the plant where less labor could be used and the same result accomplished without an additional effort on his part, money would be added to his earnings. Accordingly, some very valuable suggestions have been made by workmen which, when adopted, resulted in the benefit of all concerned in the plant.

Some of my readers may wonder what was done when a new machine was installed which would naturally displace entirely a certain number of men, and also whether or not the workmen were allowed to benefit entirely by this change. This was easily taken care of by carefully estimating the number of men displaced, or the number of men which would be required where the capacity was increased, if the same work were done by hand. For example, after the installation of the bonus system at our plant, an excavator of the planer type was installed in the shale pit, which at the capacity that the plant had been running, entirely displaced three men and gathered material in so much better shape at all times of the year that actual figures showed a resulting increase for the entire plant of over twenty per cent., due to easier grinding, better molding, more rapid drying and burning and a higher average strength in the ware. Since the installation of this machine was not due to any efforts or expenditure by the workmen, it was decided that whatever benefits were secured by the plant should be credited to the machine, thus paying for the power, oil and repairs and other expenses incidental to its operation aside from the labor actually required. It is easily understood that, since an increase in capacity of the entire plant resulted from the installation of this shale planer, the machine should not only be credited with the bonus of the men displaced but at least a share in the bonus due to the increased capacity. Other improvements made by the management were not made unless there was an evident chance for saving labor and increasing capacity, and when made, the division was always such that the men were benefited as much as the company. The success of all improvements in general has been so great that the workmen have come to look upon any improvement that might displace labor as a change that would benefit them rather than damage their interests. Such improvements in the average plant generally cause a certain amount of dissatisfaction, but under the bonus system there is a noticeable lack of this.

OVERCOMING A DISADVANTAGE OF HIGH WAGES

It has probably been the experience of all brother clay-workers that, with a certain class of men, high wages create a feeling that a certain amount of real luxury can be enjoyed. This, of course, is all right so long as the workmen can really afford it, but the employer realizes that in order to pay a sure return on his investment, he must have men upon whom he can rely with a reasonable degree of certainty day in and day out. It is true, except in a lesser degree, that it is necessary for each workmen to make his position his business the same as the superintendent or general manager must make the management of the plant his business. To make the workmen feel that the company will suffer if he is absent, some sort of bonus or premium system must be used. In the operation of our particular system, it is easy for the workman to figure out that were he to lay off a half a day to attend a ball game or for some other amusement, he will lose, not only his wages but on the average four or five dollars additional, unless he took the day allowed in which to do this. Such figures generally convince a man that where he will lose on the bonus, he cannot afford to take the time off. This is generally to his benefit as well as his employer.

Since at times it has been difficult to find men that would care to put in extra time to do odd jobs, except at a almost prohibitive price, but which were, however, necessary for the operation of the plant, the rule was made that where a man had lost time over the amount of free time allowed, he would be allowed to make up this if there was anything extra that the employer had for him to do. In this way, men that had lost time unavoidably were always anxious to help on any overtime jobs, and one of the unpleasant features of running a plant to capacity was overcome.

Another important feature of the plan as it is followed in our plant is that of keeping our organization intact thruout the entire year. It has been the bitter experience of some clay plant owners to keep men employed during the slack or winter months in order that they may be on hand when spring business opens and capacity operations are in order, and then have them leave at the critical time to accept another job for, perhaps, more wages.

To overcome this practice on the part of employes, under the present premium wage system the bonus earned for the four months of November, December, January and February is withheld until November 4 following, and then paid with interest at seven per cent. Thus, if a man remains in the employ of the company until the time when the premiums for these four months are due him, he is paid in full with interest, but should he leave before that time, he loses the bonus for these months plus the interest. During the remaining eight months of the year, the premiums are paid promptly.

In conclusion, allow me to state that the employer that has been using certain classes of rather dense and ignorant workmen and who thinks that he cannot secure an intelligent class for his plant, should investigate the premium plan for, from records that we have, it can be shown that during months when the bonus was the highest the average labor costs as well as the general and overhead expenses were actually the lowest per ton of finished ware manufactured. This should certainly prove that our bonsus system is really worked out on a correct basis. Allow me to state that, after using this system for four years, we would much prefer to close our plant rather than change to any other system of wage payment that we know of at this time.

New Jersey Clayworkers to Meet June 30

The summer meeting of the New Jersey Clay Workers' Association will be held in the Trenton Art School June 30. Three sessions will be held, morning, afternoon and evening. While the program has not as yet been completed, it is announced that Prof. A. V. Bleininger of the United States Bureau of Standards, Pittsburgh, and Prof. Edward Orton, Jr., will be the principal speakers.

A meeting of the executive committee of the association took place on June 17, at the home of Charles A. Bloomfield of Metuchen, a former president, when details of the meeting were discussed. Charles Weehans of Trenton, is now president of the state clayworkers association, and Howard Valentine of Woodbridge, is secretary.

June 27 Opening Date for A. S. T. M. Convention

The nineteenth annual meeting of the American Society for Testing Materials will be held at Atlantic City, N. J., from June 27 to 30. Headquarters will be maintained at the Hotel Traymore where the sessions will also be held.

Thursday afternoon, June 29, will be given over largely to the reports of the various committees on clay products. The report of Committee C-4: On Clay and Cement Sewer-pipe, will be heard; also Committee C-6: On Drain-tile; and a paper on "Practical Methods for Testing Refractory Fire-brick" will be read by C. E. Nesbitt. The report of Committee D-4: On Road Materials, will also be heard. This report will no doubt, be of interest to paving-brick manufacturers.

Notice to Illinois Clay Manufacturers

The outline for the uniform cost accounting system which has been adopted by the Illinois Clay Manufacturers' Association is now ready for distribution. Every clay products manufacturer in the state who has not received a copy of this outline may obtain one by writing to the Ceramic Engineering Department of the University of Illinois, Urbana, Ill.

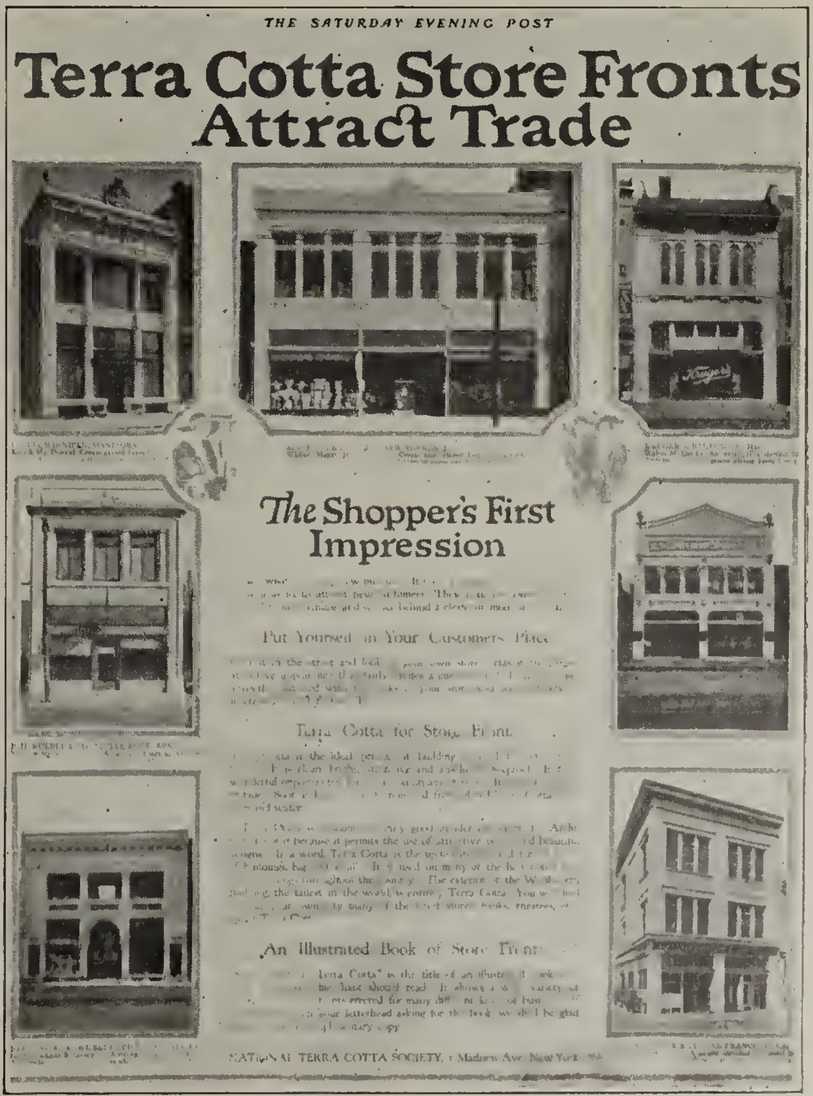
National Terra Cotta Society Starts Campaign

Advertising space in the "Saturday Evening Post" costs a lot of money, especially when purchased by the page. But this has not deterred the National Terra Cotta Society from carrying out its determination formed last December to break the silence that has too long surrounded the merits of that excellent material and to inaugurate a campaign of education, not only to contractors and architects, but to prospective builders.

A committee on publicity was appointed at the last annual convention of the society, which was held at Chicago from December 9 to 11, 1915. This committee has since been working very quietly but effectively, the result being a campaign of no mean proportions, the beginning of which is shown in the accompanying illustration—a full page ad. in the June 17 issue of the "Saturday Evening Post," which journal has a circulation of two million.

One of the noteworthy features of this ad. is that it tells something. The committee or its agent has certainly done a good piece of work in selecting a strong appeal and pushing it hard with well-written "copy" in a medium where it will have a good effect.

There is little doubt but that advertising of this kind pays. The terra cotta manufacturers who are supporting this society are to be congratulated upon their enterprise and sound business judgment.



THE SATURDAY EVENING POST

Terra Cotta Store Fronts Attract Trade

The Shopper's First Impression

Put Yourself in Your Customers' Place

Terra Cotta for Store Fronts

An Illustrated Book of Store Fronts

NATIONAL TERRA COTTA SOCIETY, 1 Madison Ave. New York

In This, the Second Article of the Series, Mr. Anderson Draws, From His Study and Experience in Other Fields, Interesting Examples of Successful Methods of Sales Promotion.

In Succeeding Articles He Will Show How Recognized Principles May Be Applied to the General Development of the Drain Tile Market. These Articles Should Be of Unusual Interest to the Officers and Members of the Various State Associations.

SALES PROMOTION *and its* APPLICATION *to the marketing of* DRAIN TILE

By John W. Anderson

Copyright 1916, *by John W. Anderson, Mishawaka, Ind.*

AN ATTEMPT WAS MADE—in my article which appeared in the June 6 issue—to measure the ultimate possibilities of the drain-tile market. Assuming that the analysis is accurate and the conclusions correct, there arises an important problem of methods to be used in ripening the greater market disclosed.

In solving this problem you may have the benefit of a wealth of experience accumulated in other lines. While you cannot lift your plan bodily from any other industry or field, an examination into methods that have brought success to others will reveal certain principles which may be relied upon in planning and directing the sales promotion operations necessary to hasten and conserve the promised harvest.

DEFINITION OF "SALES PROMOTION"

"Sales Promotion," as used in these articles, may be understood as the general term applied by modern business to those activities which relate to the creation or cultivation of a market for a product or a service. Often it is in the highest sense constructive work and, in its broader phases, it involves careful consideration and treatment of conditions affecting manufacturing and sales operations.

Its possibilities in a given line are measured principally by the soundness of the general policies of the manufacturer or industry represented, by quality of product and its adaptability to demands existing or possible of creation, and by the character and extent of natural or competitive resistance encountered.

Often, before an industry still free from monopolistic control, a fertile field for sales promotion remains under sod because of lack of initiative and vision on the part of manufacturers in that particular line, or because of the reluctance of a majority of them to organize for a work that cannot be accomplished successfully by one or a few.

This condition is a brake on the wheels of progress. Such brakes will not hold permanently. If the sluggish industry does not speed up of its own initiative, its momentum is reduced or checked by outside competition, or some adequate combination of brains and capital gently removes the brake, takes control as its fee and diverts profits to its own uses and to other conquests.

A PROMINENT CAUSE OF BUSINESS MORTALITY

The history of industry in America is so full of examples of these changes that specific cases need not be cited. What has not been so apparent, however, are the causes of failure. If the graves of the defeated companies could be opened and a searching autopsy held it probably would be found that most of them were vicitims of some curable form of the disease called neglected opportunity.

Turning from unpleasant post mortems, we find what living examples of intensive cultivation of opportunity? Here, again, cases are numerous, and disclose the fact that broadly constructive results are more frequently obtained by industries dominated by one or more closely allied companies, or represented by an association in which independent manufacturers have joined for the general development of their markets.

When the producer and refiner of oil spends money freely to perfect and, thereafter, to introduce generally an oil stove for use in the home, he is promoting the sale of oil, and the direct profits earned in marketing the stove are secondary. Your electric station is following the same lines in its efforts to persuade you that you should have an electric iron, toaster, range, sewing machine, washing machine and all of the various devices that have been perfected for the purpose of creating a wider market for electricity in the home.

Recently a prominent powder company covered the country with advertisements in leading magazines in which it advocated game farming and particularly the raising of the elusive pheasant. It is but one of a number of concerns that might profit by the sale of powder for shooting at this game, yet they judged the investment in this advertisement to be worth while. It is evident that a campaign of this kind would be much more effective if conducted by an association of all manufacturers in the line.

THE TRADE MARK IN ASSOCIATION ADVERTISING

There appeared, in recent issues of a number of magazines, advertisements by such an association of manufacturers of hot air furnaces for heating and ventilating buildings. Here the accent is placed on ventilation and on other claims of advantages of the hot-air system, as a class, over all steam or hot-water systems. An association trade mark is displayed and you are told that all manufacturers whose product has reached that high standard of perfection necessary to secure for them the right to membership in the association, are using the trade mark on their furnaces.

Thus does each contributor to the association receive his proper share of the benefits of association advertising. He uses the association trade mark in his own advertising, and makes capital of the fact that he has been admitted to membership.

This is conceded to be, in most cases, the best method of insuring equitable distribution of benefits from sales promotion thru advertising by such an association. It is more satisfactory as a rule than publishing the membership because the big manufacturer who is assessed usually in proportion to his output, complains that publishing a list of members in association advertising gives the small concern equal prominence for a less consideration. An association in Iowa tried publishing its membership in its advertising and thereby lost the support of some large manufacturers who had started as charter members. A simple, registered, association trade mark would have been more satisfactory, and probably will be found a necessity.

HAWKEYE STATE PROMOTES SALE OF PRODUCTS

Sometimes we see a state undertake to promote the sale of certain of her products. Iowa produces very little lumber and very much clay products. Lumber and clay products compete for the business of building Iowa's houses, barns, silos, and so forth. Believing that the clay products industry is handicapped because of the lack of active mason contractors, the Iowa State College, thru the constructive genius of Professor Staley, has started at Ames a course of study and training to fill this need. The direct result of this work is the education and training of men, but the indirect and more important result will be the sale and use of more building material produced in progressive Iowa.

Each nation strives, by tariff laws and in various other ways, to promote the interests of its manufacturers. A familiar example is found in the activities of the commercial attachés of the consular offices maintained abroad by our government. Governmental investigations of home conditions also are being conducted constantly in the interests of our industries.

Thus we see that "sales promotion" operates along both direct and indirect lines; that in some of its phases it can be carried on profitably by the individual, while in others it presents an opportunity and a task demanding the attention either of a huge and controlling combination or of a strong association of independent manufacturers; that it may enlist a state or nation when benefits are promised to her industries.

As examples of the extremes of methods used for sales promotion we have a railroad company sending along its line a train carrying agricultural experts who teach better farming methods for the puropse of increasing crop yields (which automatically increases the demand for the service for sale by the road) and a manufacturer of pocket knives who recently moved the thumb notch in the blades as nearly as possible to their points for greater ease in opening his knives, thus increasing his sales.

Between these two extremes lie a multitude of methods. Each business has its own peculiar conditions and must have careful and individual treatment. The manufacturer of pocket knives took a very simple and direct step toward increased business. The railroad, thru educational work, strives indirectly for a better market for its service.

AN OLD MOVEMENT THAT DID MUCH GOOD

It is difficult at times to draw the line between direct and indirect methods of sales promotion. The distinction is really of slight importance except in directing attention to potent influences sometimes ignored. The manufacturers of drain-tile recognized one such influence years ago when they labored in co-operation with other public-spirited citizens for the enactment of laws to forbid owners of land lying in the natural course of drainage denying their neighbors above them the advantages of adequate tiling. This was a splendid example of indirect sales promotion and resulted in removing a serious obstacle to the growth of the drain-tile business.

In this instance, natural conditions which often lend themselves readily to promotional effort proved an active and powerful ally for the makers of tile. They were able to secure the enactment of the desired laws much more readily because the benefits they expected were merely incidental to the greater benefits which were promised to land owners and to the public in general.

While great strides have been made in recent years by the clay industry, it has not kept pace, in some of its branches, with other leading industries in the matter of the promotion of sales.

DRAIN TILE MAKERS ESPECIALLY FAVORED

You drain-tile manufacturers have been especially favored. There has been little competition from outside materials.

Finishing the Task of Hiding the Potential Drain Forever from View. Modern Sales Promotion Methods Are Needed to Create an Indelible Record, Authentic and Easily Accessible, So That These Modest Lines of Tile May Be Given Due Credit for the Good Work Which They Do

Growing population and increasing demands for farm products have supplied a natural stimulus to your business and you have not felt it necessary, as a rule, to contribute very much toward the general promotion of your sales.

Today, you find that you have caught up with this slow growth. The aggregate capacity of all your plants probably exceeds the average normal demand. You recognize the fact that there are important sales problems confronting you to the solution of which considerable thought and effort may be contributed with profit.

There have been handed down from earlier days in the history of the industry certain sales methods and policies which have a demoralizing influence on your business. These methods, however, cannot be corrected until there exists among you a closer relationship and an understanding which can only be reached thru an association formed along proper lines for promoting the common and broader interests of the industry.

The first great constructive achievement of such an association must be the enactment of laws providing means for maintaining public records of private drainage improvements in accordance with the idea already briefly explained and to be discussed at greater length in following articles.

You have here a long neglected opportunity for most effective indirect sales promotion thru a movement which invites the support, not only of drain-tile manufacturers, but of farmers, state and national agricultural departments, lenders of money on farm security and of everybody interested in the improvement of farming conditions.

With the proposed laws once in operation there will have been established a substantial foundation upon which to build for permanent improvement in your general sales and sales promotion methods.

If these laws are to be made uniform and most effective, however, you must not rely solely upon separate campaigns conducted by state organizations. Such organizations are handicapped always because of the lack of facilities for obtaining concerted action in periods between brief annual conventions, and frequently because no funds are available for operations such as are contemplated.

It is believed that a method may be adopted by which the state organizations may secure for their membership, without undue effort or delay, the full benefits of a comprehensive movement to be conducted along co-operative lines and in the interests of the entire industry. After some further discussion of the possibilities of the proposed system of recording drainage maps, a plan for mobilizing and for carrying on the general campaign will be presented.

GASOLINE CHEAPER *than* FEED *says* PHILADELPHIA BRICKMAKER

WITH two very important points in its favor—both decidedly of pocketbook importance—William Conway, a veteran brick manufacturer of Philadelphia, Pa., presents the motor truck as the solution for the brickmaker's delivery problems.

While much has already been written concerning this method of placing clay products on the job, both from the standpoint of economy in operation and the widening of a market, yet there is always something new and interesting in the experiences of various manufacturers who have found that motor trucks do pay a substantial dividend. Particularly attention-compelling are the figures that cover the different items of expense that enter into the cost of operating a truck.

Mr. Conway has three trucks—one of five tons' capacity, with a six-ton rear axle, and two of two tons each. The large truck can carry from two thousand five hundred to three thousand brick with every load, while the two smaller ones have a capacity of one thousand each. The wagons, of which there are nine, also used by this company for delivery purposes, hold twelve hundred each.

In busy seasons the large truck makes six trips every day, hauling a total of fifteen thousand brick. In sharp contrast to this gigantic task, a team and wagon make but three trips daily, involving the delivery of only thirty-six hundred brick. The large truck does about four times as much work as a team, while the small trucks are equal to about two and one-half teams.

It has been found that it costs about eight cents a mile for tires on the large truck, while a fraction over three miles is realized for every gallon of gasoline consumed. The Conway Company figures that it costs about forty cents a mile to operate the large truck. It further states that the trucks are cheaper than teams in the long run on account of the high price of feed for the horses—this in spite of the fact that gasoline has recently taken to aeronautics.

Equal in importance to a reduction in delivery costs, this company feels that it has made a good investment in the trucks because of the wider market which has been created by their operation. Those who are acquainted with the "City of Brotherly Love" can readily appreciate the significance of the fact that Mr. Conway is taking orders for delivery in Rosemont, Ardmore and Bryn Mawr—suburbs located a distance of from twelve to fourteen miles from the city, where formerly the prohibitive price of delivering brick by team shut the company out of this attractive market. With the truck, however, it is a simple matter to throw between two and three thousand brick in the box and send it on its way. The large truck is used almost exclusively for these long hauls, making five trips a day where only six are made for city jobs.

Of course, customers are charged extra for the long hauls, this being worked out on a definite scale. Normally, brick on the yard bring eight dollars a thousand, but for delivery in the suburbs ten and even ten dollars and a half is obtained, covering very easily the cost of making the extra haul.

This plant has a capacity of fifty thousand soft-mud, red, sand-mold brick a day. It has a twenty-four chamber semi-continuous kiln of the battered wall type, together with three permanent-wall scove kilns.

Big Plans for Future Discussed at Annual Meeting of Middlesex County (N. J.) Clay Workers Association

It was an interested gathering of members of the Middlesex County Clay Workers Association that met in annual session on Wednesday evening, June 7, at the East Jersey club house, Perth Amboy, N. J. This organization is composed of clay miners and manufacturers of clay products, and all sections of the Raritan River district were represented at this meeting.

All of the officers were re-elected with the exception of Albert Boynton, secretary. His successor is Louis Huntress, Jr., of Metuchen. Mr. Huntress is connected with the Didier-March Company at Perth Amboy. L. H. McHose was re-elected president and George A. Balz, treasurer.

The session was the most enthusiastic ever held by the association. A fine dinner was enjoyed and several speeches, referring to different phases of the clay products industry, were made. It was planned to have the association work along different lines in the future in an effort to create a better understanding between the manufacturers and their employes, to mediate when labor troubles arise and to form a larger association. Much good work for the mutual interest of the clay miners and manufacturers is being accomplished by this body, and an effort will be made to get the other large industries in the Perth Amboy district to join. Some of the members are considering plans for a club house.

Most of those present discussed freely the future of the clay products situation following the close of the war and the prospects of continued prosperity in the eastern market. The consensus of opinion seemed to be that everything depended upon the attitude of other building material manufacturers in bringing down the price of materials to within reach of prospective builders, particularly steel. Most of those at the meeting seemed to think that the peak of clay products prices in the East had been reached and that conditions are going back to normal price levels and normal demand.

The following plants were represented at the meeting: the Atlantic Terra Cotta Company of Perth Amboy and Tottenville; the Didier-March Company of Perth Amboy; the Bloomfield Clay Works of Metuchen; the National Fire Proofing Company of Keasbey and Perth Amboy; the Valentine Brick Company of Woodbridge; the South Amboy Terra Cotta Company; the New Jersey Terra Cotta Company of Perth Amboy; Fords Porcelain Works of Fords; the Maurer Brick Works of Maurer; the Federal Terra Cotta Company of Woodbridge and the Ceramic Works of Perth Amboy.

Rutgers College Gives First Ceramic Degrees

The degree of ceramic engineer was given on Tuesday, June 12, by Rutgers College—the New Jersey state university—to Herman Plusch of Perth Amboy, and H. W. Bloomfield of Metuchen. This has been the first time this degree has been given by the college and carries high honors for the recipients.

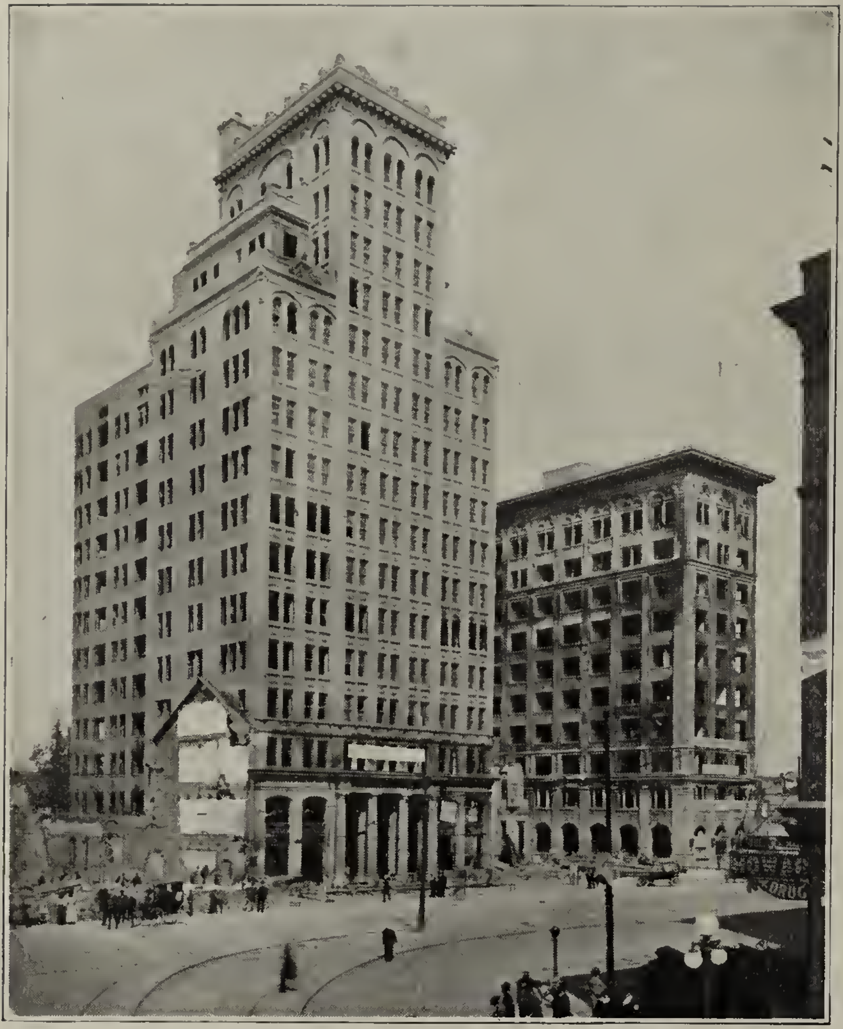
Mr. Plusch until recently was connected with the Atlantic Terra Cotta Company at Perth Amboy. He is now a consulting engineer and is also doing expert ceramic work in the Raritan River district. He also has been doing work at the ceramic department of the Jersey state college.

Mr. Bloomfield is connected with the firm of his father, C. A. Bloomfield of the Bloomfield Clay Company, Metuchen, N. J. He also has been doing ceramic work at Rutgers College, which is located in New Brunswick on the Raritan River.

Gold Medal for New Jersey Sanitary Ware

Abel Hanson of Metuchen, N. J., president of the Fords Porcelain Works at Fords, received word last week that he has been awarded the gold medal and diploma at the San Francisco exposition for his porcelain products in urinal stalls.

When the exposition opened Mr. Hanson installed some of the products of his factory in the educational department, and it is thru this department that the medal and diploma were received. Mr. Hanson's enterprise has won for him one of the highest honors in the Raritan River section in some time. The Fords plant makes a specialty of supplying schoolhouses with urinal stalls and some of the largest school buildings in the country have been equipped with the products of this factory.



The Empire Life Insurance Building, Whose Facade of Terra Cotta is Fundamentally Intact After Being Bathed in a Sea of Flames

TERRA COTTA STANDS SEVERE TEST *in* AUGUSTA (GA.) CONFLAGRATION

Withstanding Terrific Heat and Avalanches of Falling Materials from Other Buildings, This Wonderful Decorative Material Came Out With Colors Flying

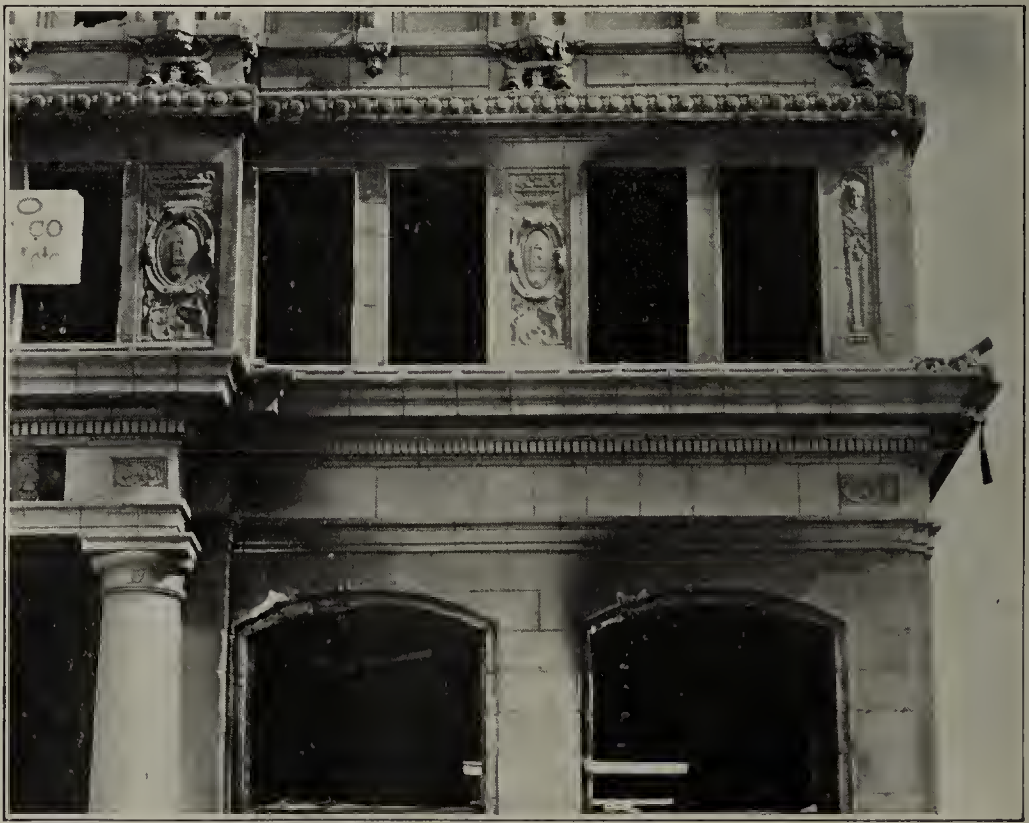
WHILE THE CONFLAGRATION that swept Augusta, Ga., on March 22, and its terrible lesson are fast fading from the public mind, as is customary in these days when there are so many subjects that are clamoring for a place in the limelight, there is one feature in connection with this fire that deserves some mention before the event is entirely forgotten. It is the part that terra cotta played in a disaster that wiped out thirty-two blocks in the business and residential sections of Augusta, involving a loss of six hundred and eighty-two buildings, valued at nearly $5,000,000.

According to authentic accounts, the fire started in the first office building erected in that city on the oldest business block on Broad street, and spread in less than a half hour to the block east that contained every new building of any importance constructed in the past five years.

From the Dyer building, which, it is interesting to note, had been condemned on several occasions by Fire Chief Reynolds of that city, the flames spread to the north, destroying the Warren block on Jackson street and the cotton warehouses in the rear. Leaping across Jackson street, the fire next attacked the new Union Savings Bank building, constructed less than three years ago. Traveling northward, the fire destroyed a number of cotton brokerage offices, insurance offices and ship brokerage offices.

The blaze continued east on the south side of Reynolds street, passing, however, around the giant seventeen-story Empire Life building that fronts on Broad street. This building was not quite completed at the time of the fire, but only what little woodwork there was around the building burned, damaging the structure to the extent of about $100,000.

The Clarke and Butt cotton warehouse, located on the north side of Reynolds street, was only slightly damaged but the fickle flames immediately turned and burned the Tubman school, next door, to the ground. A number of small structures in the same block of Reynolds street were all destroyed.



The Terra Cotta Cornice on the Empire Building That Resisted Successfully a Bombardment of Falling Materials and a Scorching Attack of Fire

From the Union Savings Bank, on Broad street, the flames worked their way to the new Chronicle building, completely gutting it, and the Herald building, the Commercial Club, the Phinizy building and the Masonic Temple were burned to the ground.

Without proceeding further in the narrative of this great conflagration nor following the path of the flames until they burned themselves out, it is desired to stop at this point to call attention to the Empire Life and the Chronicle buildings, both of which are shown in whole or in part in the accompanying illustrations.

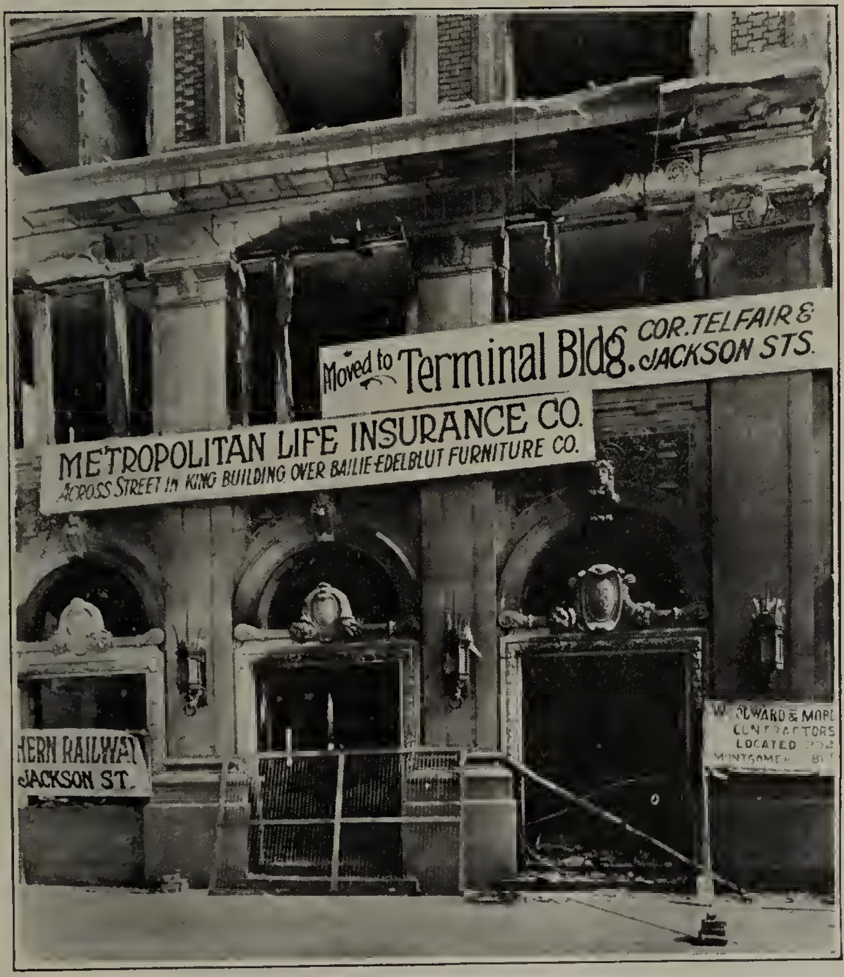
The Empire building, as has already been mentioned, stood in the center of the fire-devastated section of Augusta. The limestone face of the first and mezzanine stories, and the granite columns are spalled, chipped and calcined, but the facade of terra cotta is fundamentally intact. Even the smoke stains can be removed.

This seemingly remarkable example is really not in the least remarkable. In the process of manufacture the terra cotta which was used in this building and which was manufactured by the Atlantic Terra Cotta Company, undergoes a kiln temperature of 2,250 degrees Fahr., a far greater heat than it would be called upon to bear in any fire. More convincing, perhaps, to a layman would be a glimpse of the ware, white-hot, shimmering and translucent in a kiln under full fire.

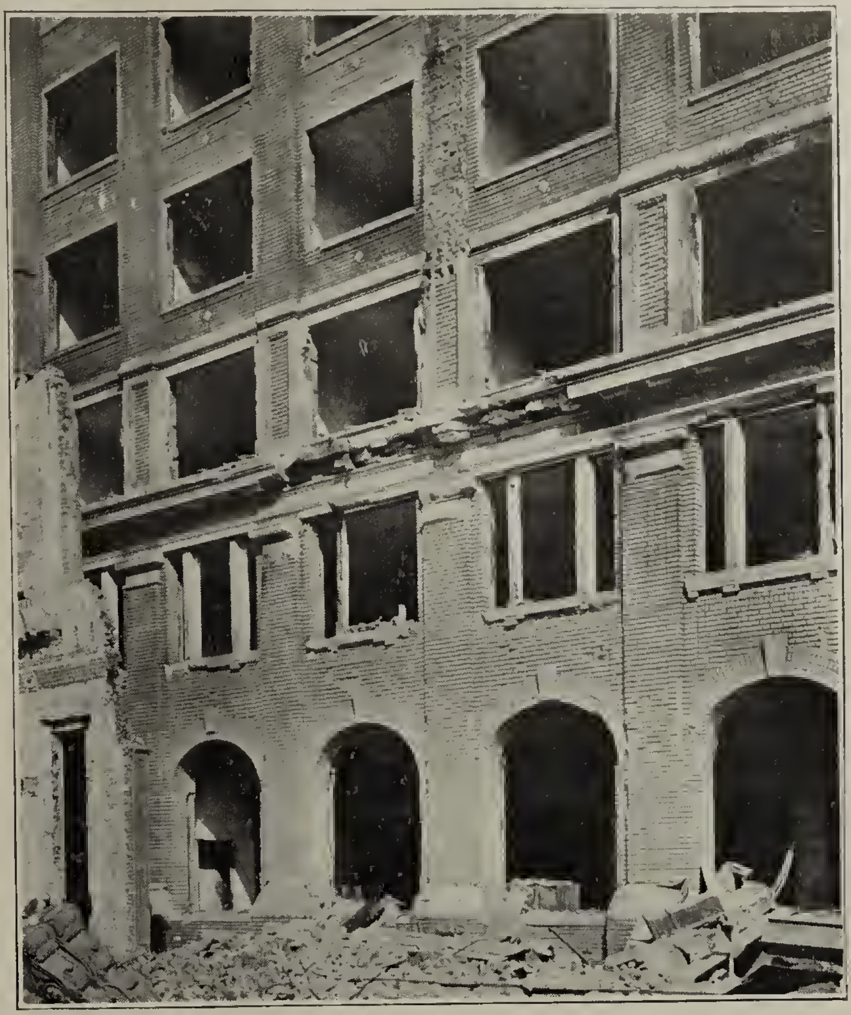
In a local fire where it is possible to reach red hot terra cotta with a stream of cold water, it may crack, and in a general conflagration it may be injured by explosions or the failure of less dependable materials, but ordinarily the devouring element cannot digest terra cotta.

In a fire that spreads from one building to another, as was the case in Augusta, the lower part of a structure is subjected to less intense heat than the upper part. Nevertheless, the heat at the first mentioned section is sufficient to effect irreparable damage to the usual building stones. The main entrance of the Empire building illustrates this point well. The base and shaft of at least one granite column were ruined, while a limestone door jamb was permanently disfigured.

The polychrome architrave of the Mason Temple, also in a furnace of flames, affords another interesting example of the fire-resisting qualities of terra cotta. This building, which was not a fireproof structure, was entirely destroyed with the exception of the architrave above mentioned. While this architrave was partly destroyed by an avalanche of other materials from an adjoining building, yet it was practically unaffected by the fire and was one of the very few parts of the building that stood after the flames had finished their destructive work.


Moved to Terminal Bldg. COR. TELFAIR & JACKSON STS.
METROPOLITAN LIFE INSURANCE CO.
ACROSS STREET IN KING BUILDING OVER BAILIE-EDELBLUT FURNITURE CO.
HERN RAILWAY
JACKSON ST.
CONTRACTORS
LOCATED

Limestone Cornice Over the Second Story of the Chronicle Building Which Was Severely Damaged by the Fire



Another View of the Chronicle Building That Was Gutted From Cellar to Roof by the Flames

A remarkable comparison of the effects of fire on cornices of terra cotta and limestone under equal conditions was found in the Empire and Chronicle buildings. The first mentioned has a terra cotta cornice over the mezzanine floor while on the Chronicle building there was a limestone cornice at the same elevation. In each case the window lintels are beyond repair. However, even a load of falling material failed to injure the terra cotta cornice on the Empire building, but the limestone cornice on the Chronicle building is severely damaged.

Nineteen-Fifteen Second Largest Year in History of Pottery Industry

A very interesting report on the pottery industry for 1915 has just been issued by the United States Geological Survey. The industry made considerable progress compared with 1914, the output of the potteries of this country being valued at $37,289,456, an increase of $1,891,295, or more than five per cent. over 1914. This value is said to be the largest recorded, except that in 1913.

In 1915 every variety of pottery, except one, increased in value when compared with 1914. Porcelain electrical supplies, the product that showed the largest decrease in 1914, rallied somewhat last year and was the class of ware to show the largest increase, or $505,750. China was the only variety of pottery to show a decrease in value in 1915, this being small, only $54,530.

The value of whiteware, including china, which comprises the general household wares and constitutes nearly fifty per cent. of the value of all pottery products, was $17,654,398 in 1915, an increase of $301,633 over 1914. If the value of sanitary ware and porcelain electrical supplies—high grade products—be added, the total value in 1915 of whiteware would be $30,283,634, or $936,330 more than in 1914.

Pottery products were reported from thirty-eight States in 1915, the value of these wares ranging from $15,894,597 in Ohio to a few hundred dollars in Porto Rico. Ohio's pottery products in 1915 increased in value $543,221 over 1914 and constituted nearly forty-three per cent. of the value in the entire country. The Buckeye State makes every variety of pottery classified in the Survey's reports, except china. Its principal product is whiteware, the output of which in 1915 was valued at $10,184,834, or nearly two-thirds of the entire pottery output and about the same proportion of the output of whiteware for the entire country. New Jersey is the second largest pottery-producing state, its wares made in 1915 being valued at $8,049,338, a decrease of $82,018 from 1914. New Jersey makes every variety of pottery classified in the report of the Survey. Its principal pottery product is sanitary ware, the output of which in 1915 was valued at $4,793,406 or sixty per cent. of the value of all of its pottery products. New Jersey reported about sixty per cent. of all sanitary ware produced in the United States. West Virginia was third in rank among the pottery-producing States in 1915, showing the largest increase in value of pottery products, namely $580,159. The value of West Virginia's pottery products last year was $4,510,623, or nearly one-eighth of the country's total. Its principal product is whiteware, valued at $2,837,766.

The value of imports of pottery in 1915 was $6,628,086, a decrease of $1,770,507 from 1914 and the lowest since 1890. This figure represents less than half of the value of pottery imported in 1907, the year of maximum imports. The value of exports of pottery of domestic manufacture in 1915 was $563,452, an increase of $36,550, or nearly seven per cent. over 1914. The imports of pottery consist almost entirely of high-grade wares, over ninety-six per cent. of the value for 1915 being of those varieties.

Pottery imported into the United States in 1915 added to the production makes a total of $43,917,542. After deducting exports—domestic $563,452, and foreign, $94,705—the apparent net consumption was valued at $43,259,385, of which the domestic production was eighty-six per cent., the highest proportion yet reached.

Electrical Porcelain Rumor Found False

It was reported in the May 2 issue, on page 836, that the idle plant in East Liverpool, Ohio, which is owned by the Electric Porcelain Company, had been sold by that concern to parties who would eventually enter into competition with the Parkersburg (W. Va.) business. This report, upon investigation, has been found to be untrue and without confirmation. It has been learned from a high authority that the property at East Liverpool has not, nor will it be transferred to any concern to be used in the manufacture of electrical porcelain or any other competitive business. It was also stated in the above mentioned item that George O. Anderson, who is connected with the General Porcelain Company as secretary and treasurer, would be identified with the new concern. This has likewise been found to be untrue. The fullest expectations of the General Porcelain Company have been realized thru the operation of the modernly equipped Parkersburg plant and the company has been enjoying splendid success since moving to that city. Neither Mr. Anderson, nor any of the other officers connected with the company have any intention of severing their connections with it. At the time the item above referred to was published, a rumor was current in East Liverpool that a deal similar to that outlined in the May 2 issue would be put thru, but to date it has not been possible to obtain a confirmation, on the other hand later events have found the report to be untrue.

Clay Wares Excel in Photographic Work

An interesting use for clay products has come to the front in the photographic world. It seems that the chemicals used in developing films destroy utensils made of wood, metal or other products, but vitrified clay wares are impervious to the action of these chemicals. Horace Taylor who is at the head of one of the large photographic developing concerns of Louisville is very enthusiastic about some glazed clay utensils which were recently installed, and which have given great satisfaction.

A NEW MEMBER *of the* CHICAGO BRICK FRATERNITY

Having Become Famous as a Member of the Renowned Committee That Provided the Entertainment for the N. B. M. A. Convention at Cleveland During the Early Part of This Year, William H. Gifford, alias "Giff," Again Steps into the Limelight to Announce His New Connection with the Wisconsin Lime and Cement Company, of Chicago, to Succeed George P. Anderson, Who Has Resigned.

Mr. Anderson Has Returned to His Former Position with the Briggs Company, Lansing, Mich.

Mr. Gifford was Formerly with the Cleveland Builders' Supply Company for Nine Years, Having Held the Position of Salesman, and Later, Salesmanager. "Giff" is Thoroly a Brick Enthusiast, and, as an Indication of His Sincerity, is Planning to Replace His Wooden Desk Top with One Built of Brick.

PRICE CUTTING

The Disease of the Face Brick Business and Its Remedy—a Course That Contains Much Promise for the Future

By J. Parker B. Fiske

Vice-President, Fiske and Company, Inc.

The Following Paper, Read by Mr. Fiske at a Meeting of the Directors of the American Face Brick Association Held at Pittsburgh, Pa., May 12, Outlines a Plan the Adoption of Which Would Advance the Business of Selling Face-brick at Least Ten Years.

An Able Committee from the Association Now Has the Plan in Hand, With Instructions to Work Out the Details and Report at the Earliest Possible Moment to the Executive Committee.

THE face-brick business is sick.

It has been ailing for some years and is rapidly growing worse.

It is now attacked in the vital organ—its treasury.

To be more specific, the cost of manufacturing brick has steadily increased during the last ten years, while the selling price has steadily gone down.

Things have now reached a crisis—the average brickmaker can no longer make any profit in his business.

Unless something is done it is doubtful if many brickmakers can survive, for no man can continue in business indefinitely without a living profit.

While things were very bad in 1915, they are much worse in 1916. Labor has advanced fifteen per cent. to twenty-five per cent.; fuel, fifteen per cent. to twenty-five per cent.; supplies, fifty per cent. to three hundred per cent. Something must be done or the brick business will "go broke." There are some exceptions to this statement. Here and there a brickmaker, by reason of favorable conditions, superior product, trade-marked name or other individual advantages, is making some money; but, generally speaking, as one travels east, west, north or south, he is confronted with the same question: "What is the brick business coming to?"

INDIVIDUAL EFFORT OF LITTLE AVAIL

The individual brickmaker is helpless to remedy this condition. He is not large enough nor does he command sufficient influence. In the steel business, cement business, lumber business, etc., individual concerns controlling forty to sixty per cent. of the trade are powerful enough to "set the pace" and the little fellow follows. In the brick business we are nearly all little fellows, even the largest concern dominating not more than fifteen to twenty per cent. of the entire business of the country.

Some united effort on the part of many brickmakers is necessary to correct the present conditions.

The only medium thru which this co-operative effort is possible is the American Face Brick Association. Now is the time, therefore, for the association to step forward and undertake a great and far-reaching movement for the benefit of its members and the trade generally.

What can it do?

Before answering this question let us make a further analysis of the brick business, to find out exactly what is the matter.

MANY CAUSES ADVANCED FOR AILMENT

Many answers have been proposed to this question. Some say it is rought-texture brick; some, that it is due to the brickmaker's ignorance of his cost of manufacture; some, that it is over-production; some, that it is decreased volume of building construction, etc., etc.

All of these answers are, in a measure, correct, for each of these things is contributing to the present conditions. None of them, however, in my opinion, is the principal answer to the question.

The real trouble is with the brickmaker himself.

He does not have his business under proper control.

He does not run his business— it runs him.

The purchaser fixes his price and terms under which the brickmaker shall sell his ware.

Very often his competitor regulates his production.

It is time for the brickmaker to begin to run his own business.

But he cannot do it in its present chaotic condition.

The brick business has got to be standardized.

At present there are no standards—of size, quality, price or service.

There is no common basis of value, hence no standard price.

The purchaser is shrewd enough to take advantage of these conditions and to dictate his own terms to the brickmaker.

All of the above items must be standardized before the face-brick business will be free from its present turmoil.

THE ALL-IMPORTANT MATTER OF PRICE

Passing over, for the moment, the question of standardizing size, quality and service of facebrick, let us examine the great item of price.

As stated above, the price is fixed by the retail purchaser—at least to a large extent.

The manufacturer, as a rule, does not reach the retail purchaser, but deals with him thru an intermediary, of whose actions he has little knowledge and less control.

This intermediary is, in many cases, of limited experience, poor judgment and a low standard of business ethics. Often his only object is to "beat out" his competitors without regard to profit-making or moral conduct.

It is to be regretted that where the manufacturer sells his own product he often employs salesmen who apparently are of no higher grade than the intermediaries above mentioned.

I wish to say very clearly that this estimate is not true of all who are selling face-brick at retail, for among them are many whom I am proud to claim as my friends and for whose ability and integrity I have the highest respect. Unfortunately, there are enough of the low grade kind to depress the whole industry to a low plane and to keep it there despite the efforts of those who are conscientiously working to uplift it.

By reason of the lack of standards of all kinds (particularly a standard of price) and of the inefficient, vacillating conduct of the face-brick salesman, the purchaser finds it easy to dictate price, terms and mode of service. All this re-acts on the manufacturer, who is constantly beaten down in price by his agent who, in turn, is beaten down himself by the conditions which he faces and which he is helpless to remedy.

DIRECT CONTROL OF PRICE AN EFFECTIVE CURE

To correct these conditions the manufacturer must now begin to exercise a positive, direct control over his business, not only in the manufacture but in the sales department—he cannot afford to allow the sales agent to run that all-important branch of his business any longer.

This does not mean the elimination of the sales agent—far from it. He performs a very necessary and useful function and is entitled not only to the pitiful compensation which he now receives for his services, but to a generous remuneration and to such support and assistance of the manufacturer as will relieve him of the burdens under which he is now struggling.

But he must act under instructions, if any semblance of order is to be brought out of the present chaos.

The reason is obvious. The manufacturer is the only one who can determine his costs. This he must do and, adding his profit, he must fix the minimum wholesale price. To this must be added a living profit for the agent, thereby fixing the retail price to the consumer.

This retail price to the consumer must be protected and maintained in order that the manufacturer and the dealer may live and prosper.

This is the crux of the whole matter. If the retail price to the consumer is not protected the wholesale price to the manufacturer cannot be protected. Both the dealer and the manufacturer will lose their profit and ultimately be driven out of business.

The retail price is not being protected at the present time and that is the sum and substance of the trouble in which the face-brick business now finds itself.

THE ORIGINAL "SIN" OF THE BRICK BUSINESS

Why is the retail price not being protected? Because some agent or some salesman in some locality cuts the price on some individual job. Then follows retaliation by another agent, then by another and another, until retail prices are beaten down to a point where the agent must demand a cut price from the manufacturer in order to exist. In the end he gets his cut price either on individual jobs or in the form of a general reduction.

This is followed by similar action on the part of other manufacturers, until we see prices going down and down to their present level.

The whole trouble can be traced back to that original job, ten, twenty or maybe fifty years ago, when the manufacturer or his agent cut his price in his eagerness to get that one job, blind to the folly of his act—to the inevitable demoralization of the whole industry, which was just as certain to follow his conduct as water is certain to flow to the sea.

This is the "original sin" in the brick business which has brought "damnation" to us all.

Until this "sin" is rooted out—until price cutting on individual jobs is absolutely stopped, there will be no "salvation" for the industry.

TWO WAYS OF STOPPING PRICE CUTTING

But, how can price cutting on the individual jobs be stopped by the manufacturer who is often five hundred miles away and knows nothing of the circumstances of the retail transaction?

Only by one of two ways. By persuading his agent not to cut prices or by absolutely taking away his power to do so.

After twenty years' experience in the brick business, both as a manufacturer and an agent, I am convinced that, so long as the agent has the control of retail price making the manufacturer can never prevent price cutting. The agents are too scattered and have interests too diversified to make it possible to ever get them together to act in unison. They are not only too far away from the manufacturer for efficient control, but, as a body, are too irresponsible to the manufacturer to make that control possible.

The manufacturer must take out of the agent's hands the power of cutting the price on individual jobs.

This is my remedy for the present deplorable conditions in the face-brick business.

It is easy; it is legal; it will be absolutely effectual.

But how can it be done?

By adopting the methods of the steelmaker, the cement-maker, the plumbing goods manufacturer, the automobile manufacturer, the talking machine manufacturer, and scores of others.

Publish your prices to the consumer.

Take off your "gum shoes."

Stop "pussy-footing."

Come out in the open and show yourselves.

Become the real business man who is not afraid to stand up before his fellowmen and boldly state what he manufactures and what prices he proposes to charge.

Then the community will begin to show some respect for the brick business and the brickmaker and will begin to pay a respectable price for your wares.

A BRIEF OUTLINE OF THE PLAN

To be more specific, the plan briefly is as follows:

1st—Let each member of the association fix upon the average net price per thousand at which he is willing to sell his brick in carload lots f. o. b. cars his plant.

Let him add to this price a satisfactory commission per thousand as a remuneration of the agent for his services.

Let him designate the sum of these two figures as his retail price per thousand to the consumer, irrespective of size of job, location, or personality of the purchaser.

Let this price be fixed independent of his competitors and without collusion with them.

2nd—Let him publish to the architect, the contractor, the agent, his competitors and the whole public generally a printed price list, giving a brief description of his brick and the retail price per thousand to the consumer, in carload lots f. o. b. cars his plant, the cost of transportation and trucking to be added where brick are sold at destination.

3rd—Notify the agent that any deviation, either up or down, from these established prices will result in the loss of his agency.

4th—Let every manufacturer and every manufacturer's agent keep his books, correspondence and records open at all times to the inspection of an official Auditor, appointed by the Association.

Make an inflexible rule that any deviation by a manufacturer or his agent, or his salesmen, shall be published in detail to all members of the Association, said publication to be issued by the Auditor without reference to any committee or other official of the Association. In other words, clothe the Auditor with sole power to determine the facts and to publish them.

5th—Let the manufacturer publish new price lists from time to time, whenever and as often as he wishes to modify his prices, it being understood, however, that the new price list must be published and distributed before prices on individual jobs are changed.

Such are the essential features of the plan which I propose.

Before such a plan can be made effective, many details must be studied and carefully worked out. Careful conference with many manufacturers and their agents must be had in order that the final details may suit, to the largest possible degree, all localities, all manufacturers and all conditions.

The permanence of the plan must be sufficiently guaranteed to justify the manufacturer in somewhat modifying his distributing system to accommodate the new conditions.

SOME FORESEEN OBJECTIONS ANSWERED

I can hear a score of objections raised to this plan, each of which I shall try to answer in turn.

(a) "It is illegal."

There is no question, according to the best authorities whom I have consulted, as to the legality of the proposition thus far outlined. Every man has a right to establish his own prices and to publish them and to adhere strictly to them. Moreover, he has a right to demonstrate to the public that he is adhering to them. He must, however, make his prices independent of his competitors and without collusion.

(b) "I would not allow anybody to examine my books."

To this objector I have only one thing to say, and this I say without fear or favor, and I ask you to carefully observe the language which I have chosen:

The willingness of any man to have his acts investigated and made public is a true measure of his sincerity of purpose.

Publicity is a great "cure-all." The law breaker, the thief, the crook and the liar cannot stand publicity—the honest man can. Publicity as to the acts of public officials, corporations and business men generally is working a revolution in our social and economic life.

Applied to the brick business it will work an equally important revolution. It will, once and for all, stop the vast amount of complaint, gossip and slander which is now eating out the very vitals of what little ethics there is left in the brick business.

If a man is not doing what he should, publicity properly applied will shame him into reputable conduct. If he is conducting his business honestly and on a high plane, he will no longer be obliged to submit hopelessly to the calumny which is being heaped upon him.

By all means let us have publicity, but let it be accurate and absolutely truthful. Let us once and for all eliminate gossip and rumor and substitute in its place the truth, accurately obtained by a disinterested party.

(c) "Contractors won't buy at fixed prices."

(d) "Contractors expect a discount."

(e) "The trade has gotten used to buying brick as at present and won't change."

(f) "Large buyers expect a lower price than small buyers."

All of these objections may be disposed of quickly. They have all been disposed of and forgotten in scores of other lines of business. They will meet the same fate in the brick business.

The retail face-brick buyers will continue to demand their present unfair advantages just as long as the brickmaker continues to show any weakness in his refusal. The moment the buyer is told how he must buy brick and at what price, he will gracefully yield.

I am not speaking from theory—I am speaking from actual experience. Certain products manufactured by my company have been sold for nearly a year at a fixed price, including commission to the agent. In most cases the purchaser has bought the brick f. o. b. plant, has paid his own freight and teaming and been responsible for damage and delay in transit. Practically no objection has been raised by the contractor to this system, and the ease, simplicity and economy with which we have been able to do business on this basis have been truly astonishing.

(g) "Some members will cut the price and cover it up."

This doubtless would be true to a slight extent. No code of laws has ever been effectual in absolutely eliminating wrong doing, no matter how great the penalty has been. Yet that is no reason for abolishing law. It would be just as sensible to argue that all laws against murder should be abandoned because murder still continues, notwithstanding the severest penalty known. Just as crime has been largely eliminated by modern laws, so price cutting in the sale of face-brick could be eliminated to such an extent that what little remained would be almost negligible.

(h) "Despite publicity, some people will still cut the price and defy the sentiment of fellow members."

I doubt very much if any brickmaker or his agent, however unethical he may be considered, would intentionally and deliberately cut his price, knowing that his books must be open for inspection by the Auditor and the facts published to his fellow brickmakers. Certainly he would not continue in this practice after his acts had once or twice been thus made public.

However, just as penalties are more effectual in preventing crime than is mere public sentiment, so a heavy fine would doubtless be most effectual in preventing price cutting. Here, however, the question of legality must be carefully investigated. If a system of contracts can be devised and instituted without infraction of the law, whereby each member will agree to establish the "Open Price System" for a certain term of years, subject to heavy penalties for any infraction of the rules, and will back up his contract with a suitable bond, the "Open Price System" could be made effectual beyond the shadow of doubt.

(i) "First quality brick will be delivered at second quality prices."

This opens the whole question of "standards," from the lack of which the face-brick business has always suffered badly. In the cement and steel business, standards of quality are definitely fixed. In the brick business, no two manufacturers have the same standards, and many manufacturers have no standards whatever. Without going into detail at this time, I believe it is perfectly possible to establish fairly definite standards for first and second quality face-brick and to adhere to them with reasonable accuracy. In case of deviation from these standards by manufacturers who desire to secure unfair advantage by delivering No. 1 quality brick at No. 2 prices, I believe the fraud could be detected fairly well in most instances. I am free to say, however, that this is one of the details of the face-brick business which can probably never be reduced to absolute perfection.

(j) "Too flexible. Robs me of my liberty of action."

A man living alone on a desert island needs no rules to guide his life. He can do as he pleases because he is responsible only to himself. When men begin to associate together, however, they are, by the very nature of things, subject to restraints which are necessary for the common good. The more highly society is organized, the more stringent these restraints become.

The proposed system is, of course, much less flexible than the system now in vogue and that is exactly the intention. It is necessary to take away the flexibility which is the principal curse of the business, and place the individual under proper restraint.

Yet, after all, it is not very inflexible, for each individual member of the Association is free to change his prices at any time. All he has to do is to publish a new price list. If he wishes to do this every year, every month or every week he is at liberty to do so. The only rule is that he must publish a new price list before making it effective, just as the Interstate Commerce Commission requires the railways to publish and file new freight tariffs, a certain prescribed length of time before they become effective.

(k) "Won't suit my local conditions."

This is a matter which I am not at present prepared to discuss in detail. There are doubtless conditions in certain localities which would make the adoption of the "Open Price"—one price to all—irrespective of location or size of job, somewhat awkward and inconvenient at first. It is even possible that some manufacturers who are doing a very large local business, with a comparatively small percentage of distant business, might have to readjust their business to a considerable extent, but for the face-brick business as a whole, where material is sold largely thru agents in distant places, it is perfectly possible and practical. Once the brickmaker has the courage to adopt it, it will work a revolution in the face-brick business.

BUSINESS MEN URGE RAILROAD INVESTIGATION

Congress will be asked to direct the Interstate Commerce Commission to investigate at once certain phases of the threatened interruption of railroad traffic of the country. Taking into consideration the fact that the demands concern not only some 300,000 employes in the four brotherhoods, but affect every industry in the entire country, business men thru a referendum of the Chamber of Commerce of the United States by the largest vote ever cast by the affiliated organizations of the National Chamber have endorsed the proposal that the Interstate Commerce Commission go into the matter as soon as possible.

Thru a joint resolution endorsed by the referendum the Commission will be asked to report to Congress as soon as practicable upon wages paid with hours of service to each class of railroad employes and other relevant matters. According to the preliminary count given out by Elliot H. Goodwin, general secretary of the National Chamber, the majority was overwhelmingly in favor of the proposition, 981 votes for and only 30 opposed, each organization being allowed from one to ten votes according to its membership. Participating in the vote were 364 organizations representing forty-three states, the District of Columbia, and Hawaii.

As relating to the controversy having to do with a shortening of the railroad hours of labor without corresponding decrease in pay and for increased compensation for excess service performed, the congressional resolution which will be asked for by the National Chamber in compliance with the referendum vote, will direct the Commission to go thoroly into the question of minimum, maximum and average wage paid, with hours of service for each class of railroad employes in the United States, and so far as they are comparable, the minimum, maximum and average wage with hours of service paid in other industries where similar skill and risk are involved, the relation of wages to railroad revenues, the question of whether railroad revenues based on existing rates for transportation will admit of equally favorable terms for all classes of railroad employes, and any other matter in this connection that the Commission may deem relevant. Further, it would be the sense of Congress that the railway companies, their officers and employes, should give their hearty support and co-operation to the Interstate Commerce Commission in its investigation, deferring pending controversies over questions at issue until that Commission may be able to complete its investigations and make its report.

Of particular interest now is the personnel of the Railroad Committee whose prompt action was so speedily endorsed by the National Chamber. Harry A. Wheeler of Chicago, its chairman, was the first president of the Chamber of Commerce of the United States. Also prominent are: James Couzens, formerly president of the Detroit Board of Commerce and a director of the Chamber of Commerce of the United States; Robert H. Downman of New Orleans, president of the National Lumber Manufacturers' Association; Charles E. Faeth, vice-president of the Kansas City Commercial Club; Dr. Livingsston Farrand, president of the University of Colorado, Dr. Thomas F. Gailor of Memphis, Chancellor of the University of the South; C. A. Johnson, formerly president of the Madison (Wis.) Board of Commerce; E. T. Meredith of Des Moines, publisher of "Successful Farming," and a director of the Chamber of Commerce of the United States; William Fellowes Morgan, president of the New York Merchants' Association; A. J. Porter of Niagara Falls, president of the Shredded Wheat Company; Frederick M. Weed, a lawyer of Boston, and Oliver Wilson, Master of the Grange, Peoria, Ill.

The National Chamber will now endeavor to carry out the program outlined in the referendum which is to secure the introduction and passage of a joint resolution empowering and directing the Interstate Commerce Commission to make the investigation which has been called for.

Texas Brickmaker Sees Export Possibilities

B. E. Norvell, president of the Bay City (Tex.) Brick and Tile Company, recently expressed himself as of the opinion that a very profitable and rich field for the manufacturer of brick and tile lies in the markets of Central and South American countries. Mr. Norvell is planning to organize a group of Texas clayworkers to undertake the development of these markets. He has been especially active in Galveston, the logical port thru which trade with these countries could be carried on.

MAGNESITE BRICK *in* WAR TIMES

The Cause of the Present High Price of These Brick, Together with the General Physical Characteristics of California Magnesite

By John L. Dickson
Efficiency Engineer, General Refractories Company

WHY are magnesite brick high in price? This is the main topic of discussion among leading steel men today. Answering this query in the abstract, we might say they are high in price because they are high in magnesite. This assertion probably appears evasive to the level-headed and practical steelmaker, but, nevertheless, it is a truth not to be denied. For instance, the Grecian and Austrian magnesite show an analysis similar to the following:

Silica (SiO_2)	.75
Alumina (Al_2O_3)	.38
Ferric oxide (Fe_2O_3)	3.30
Lime (CaO)	1.17
Magnesia (MgO)	42.80
Carbon dioxide (CO_2)	52.10

Whereas, the California magnesite, out of which the present day magnesite brick are manufactured, looms up thus:

Silica (SiO_2)	.39
Alumina (Al_2O_3)	.31
Ferric oxide (Fe_2O_3)	.11
Lime (CaO)	.04
Magnesia (MgO)	47.18
Carbon dioxide (CO_2)	51.87

By comparing these two analyses it is seen that we have a most excellent material in the California magnesite.

Before the beginning of the European war the Grecian and Austrian magnesites were delivered in this country to the manufacturers of refractories at a much less cost than the domestic product, but since then it has been possible to get but very little into the country, due to the embargo on such material which has been imposed by foreign governments. The refractories manufacturer was forced, as a consequence, to turn to California for his material. This necessitated a very high-priced magnesite, as the labor cost and transportation charges are much greater than on the foreign material; but even under these adverse conditions it has been almost impossible at times to obtain the domestic magnesite and its producers have advanced the price time and again. In fact, the cost of the raw material today almost prohibits its use. Then, in addition to this, the cost of manufacture of the brick has steadily increased, a heavy advance having been made in the price of coal, labor and, in fact, everything used around a modern brick plant. To be frank, should the steelmaker be able to secure his magnesite brick in the neighborhood of five hundred dollars per thousand pieces, he would be well satisfied. It is not a matter of price these days, but delivery.

And since we are getting such excellent results from California magnesite, a general discussion of these deposits should be of interest to those making magnesite brick.

Magnesite (magnesium carbonate) is found in masses or in veins replacing rocks high in magnesia. It is not a common mineral, yet it exists abundantly in southern California, scattered along the Coast Range from Mendocino county to a point south of Los Angeles, and along the western slope of the Sierra Nevadas from Kern county to Placer county.

As it is found in the California deposits magnesite, when of high quality, is a white fine-grained, beautiful rock, with a conchoidal fracture that resembles a break in china, as shown in the accompanying illustration. When subjected to a fine polish it is an opaque white.

Ordinarily it is quite probable that both magnesite and serpentine are formed in a decaying process of the original minerals in basic rocks and peridotites and that, during the decay of the serpentine, the formation of magnesite is continued; however, the magnesian mineral is changed to the carbonate, dissolved by heated water charged with carbon dioxide, and precipitated in crevices as veins, the silica being taken away in solution by the water and is frequently deposited with the magnesite veins as quartz.

California Magnesite Showing Conchoidal Fracture

The pronounced outcrop and the pure whiteness of the veins at once give a strong contrast with the dull or dark colored surroundings so that their location immediately becomes known.

There is a noted difference in the purity of the veins at different locations. Some are snow white and pure, and contain very little foreign matter, while others are darker in color and contain clay, silica, iron or serpentine in various quantities. As these fields have not been worked extensively, very little is known as to the depth to which they extend, but it is thought they go down at least several hundred feet in the best deposits.

Refractories Manufacturers Adopt American Face Brick Telegraphic Code

The American Face Brick Association has, as the phrase is, "filled a long felt want" by preparing and distributing a carefully compiled telegraphic code. This code contains not only a very complete list of phrases applicable to the manufacture and distribution of face building brick, but a very comprehensive list of railroads and of numbers whereby it will be possible for a shipper or buyer of face-brick to send and receive messages containing car numbers and initials as well as dates of shipment and routing, bringing all of this information well within the ten word minimum.

It also contains a list of all of the individuals, firms and corporations to whom the code has been distributed and each of these, in turn, has been coded.

So complete is this code that it has been found applicable to another branch of the clayworking industry and by order of its executive committee, The Refractories Manufacturers' Association has adopted the code and distributed copies to its entire membership. Further information regarding this code may be obtained by addressing R. D. T. Hollowell, Secretary, American Face Brick Association, Fulton Building, Pittsburgh, Pa.

New Manufacturers' Association Up and Doing

The Monmouth Manufacturers Association met in regular session at Matawan, N. J., on June 7. In the absence of the president, J. A. Fitzinger of the National Fire Proofing Company, Lorillards, N. J., George J. Craigen of the Craigen Brick Company, Cliffwood, presided.

The report of the membership committee indicated that there is a growing interest in the association on the part of clay products manufacturers, as well as other industries in the Keyport section. Three applications for membership were acted upon favorably. It was voted that at the next meeting no business would be considered, the session to take the form of a dinner, the time and place of which is to be announced later. On a motion duly carried a standing traffic committee was named to represent the association in negotiations with the Pennsylvania Railroad, and the Central Railroad of New Jersey with a view toward improving the freight handling facilities at Keyport and Matawan, and to handle other details affecting the transporting of freight consigned to or shipped from the manufacturers in this locality. The committee consists of the following: Messrs. Craigen, Fitzinger, Devlin, Miller, Carter, Eggleston and Menist.

The lack of housing facilities for workmen in both Matawan and Keyport was discussed and a committee appointed to confer with real estate agents for a list of available dwellings and boarding places for clay plant and other employes. This committee includes Messrs. Lisk, Fischer, Eggleston and Gill.

Texas Brickmakers to Form Association

At a recent meeting of the representatives of about half of the brick manufacturing concerns in Texas, held at the Galves Hotel, Galveston, recently, steps were taken toward the formation of a state association.

Altho a formal organization was not effected at this meeting, definite action was taken to secure the support of all Texas Clayworkers. Max D. Almond, vice-president of the North Texas Brick Manufacturers' Association, including the members of the clayworking fraternity operating in the northern portion of the state, has been authorized to get in touch with those not present at the meeting, and enlist their support.

For several years the former state association has been inoperative. Brickmakers in the vicinity of Dallas, however, formed themselves into the North Texas association and it is thru their efforts that the scope of the organization is being extended to include the clayworkers in the southern section of the state.

At the Galveston meeting various matters of interest to those present were discussed. It was pointed out that the recent Paris (Tex.) fire has created an abnormal demand for building materials. The rest of the state is also reported as demanding an unusually large amount of brick—without the aid of the stimulant given building operations by the Paris conflagration.

Detroit Has Averted Possible Brick Shortage

The prediction made early in the year that 1916 would be the biggest building year Detroit ever saw, and the biggest for the brick manufacturers and dealers, is certainly being borne out. Right now there is an unprecedented demand for brick, and dealers and manufacturers are beginning to wonder what they will do to properly take care of all orders. In this connection, however, William B. Wreford, manager of the Detroit Brick Manufacturers' and Dealers' Association, says:

"All possibility of a brick shortage has been averted in Detroit. About a month ago, when it became apparent that the local output would not equal the demand, most of the manufacturers made arrangements to purchase brick outside of Detroit to take care of the shortage, and as a result about 4,000,000 brick has come to Detroit from outside markets and 2,000,000 more will be shipped in by an early date. These, together with the output of the local yards, should be ample to take care of the demand. All of the Detroit manufacturers experienced labor troubles just at the time when men were needed most, but the differences have been adjusted and within a few weeks, every brickmaker will be more than able to supply all wants without outside assistance. It has cost the Detroit manufacturers over $2,000 to prevent a shortage.

"The present additions now under way will increase the local production 65,000,000 a year, or make the total Detroit brick production 365,000,000. Experienced labor is not plentiful by any means, and any brick plant laborer with experience can get work. Unskilled laborers are paid thirty cents an hour and experienced labor thirty-five cents an hour and more, according to the task."

Lawyer Explains Workmen's Compensation Law

William J. Duffy, a member of the state legislature and a prominent local attorney, recently delivered a very interesting address before a large meeting of the Louisville (Ky.) Builders' Exchange on the recently enacted workmen's compensation law which goes into effect on August 1. Mr. Duffy thoroly explained the workings of the law, which he claimed was as good or better than any now in operation in other states. According to Mr. Duffy, the experts have conceded that the new law is constitutional in spite of the fact that it is practically compulsory. Mr. Duffy explained the relations between the employe and employer, the contractor, the subcontractor, and so forth, in a very interesting way. There is some talk of the Builders' Exchange organizing a mutual insurance company to protect the allied interests in the state.

MARKETING *the* PRODUCT

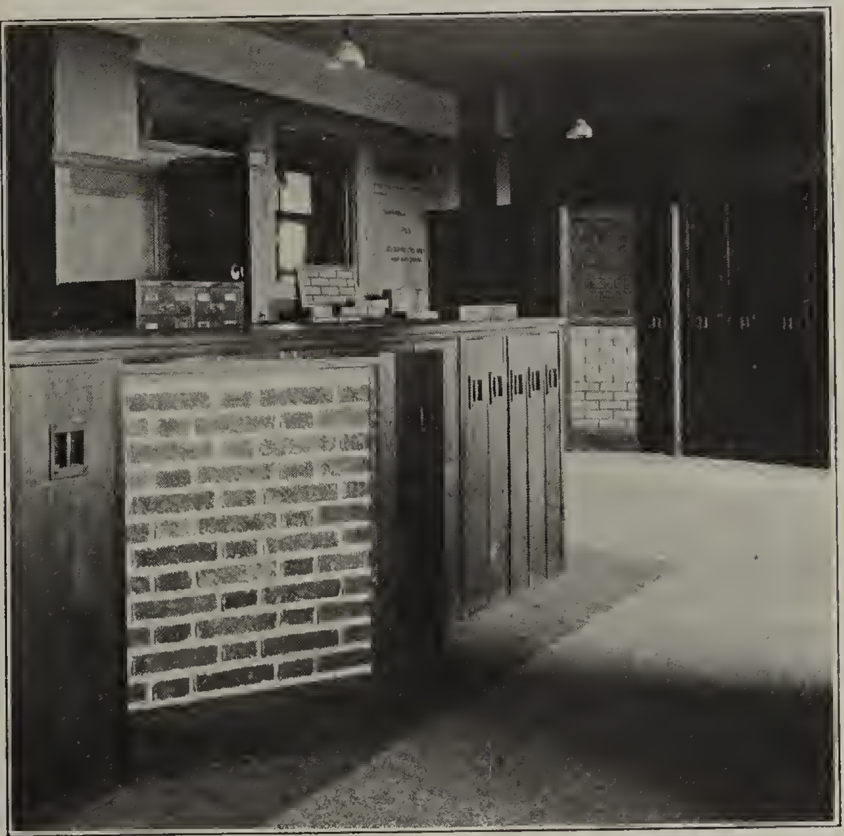
Helpful Articles and Timely
Suggestions for the Dealer and
the Manufacturer's Sales Force

MAKING IT EASY
TO SELL THE CUSTOMER

SINCE THE DATE of its inception the brick sales office has been designed and constructed along much the same lines. The spirit of confusion and unrest brought about by a multitude of differently colored panels has been considered a necessary evil—one to be endured. In correction of this weakness the tendency has been to erect additional decorative displays in the form of piers, fireplaces and fountains that tend to increase the sense of confusion rather than produce a restful and decisive atmosphere in the display room.

Upon entering the ordinary sales office a prospective buyer of face-brick, unless he knows definitely the exact color and character of the brick he wants, finds it an exceedingly hard matter to make a choice. It is almost impossible to distinguish, in the appeals made by the many panels, that brick which conforms best to prevailing conditions or the needs of the customer. In other words, the comparative beauty and attraction of all the panels hinders rather than helps the prospective buyer in deciding upon the brick that will suit him best, when all of the panels are exposed to his view.

Or it may be the matter of price is a governing feature. In this case a brick higher in cost than can be afforded is usually favored. Seeing it in the wall the customer is well pleased but upon inquiry finds it to be above his means. With the impression of this brick on his mind it becomes doubly hard to satisfy him. His attention is constantly redrawn to the favored panel and, in many instances, he leaves the office in an attempt to duplicate the brick elsewhere at a lower price—and a sale is lost. This argument also applies to those brick which the salesman may not, for some reason, care to display. Should the stock represented by the brick in one of the panels be exhausted or that line oversold, or for some other reason it is not to the advantage of the salesman to take orders for it, he is placed in a very trying position if the customer takes a liking to that particular brick and insists upon getting it. If it had been possible to conceal that panel until such a time as it was again desired to place it on display, the uncomfortable position would have been saved the salesman and a more satisfied and easier sold customer would have been served.



One of the Panels Set in the Case at an Angle. A Noteworthy Feature of This Arrangement is the Perfect Light Cast Upon the Brick

Not only is the time-honored method of displaying face-brick a hindrance to its sale in many cases, but it is an exceedingly expensive medium. Rental rates constitute an appreciable percentage of the cost of selling face-brick, especially in the larger cities where this item assumes very large proportions. Extensive offices are necessary, under the present system, to properly display all the styles of brick, laid up in various bonds and differently colored and finished mortar joints.

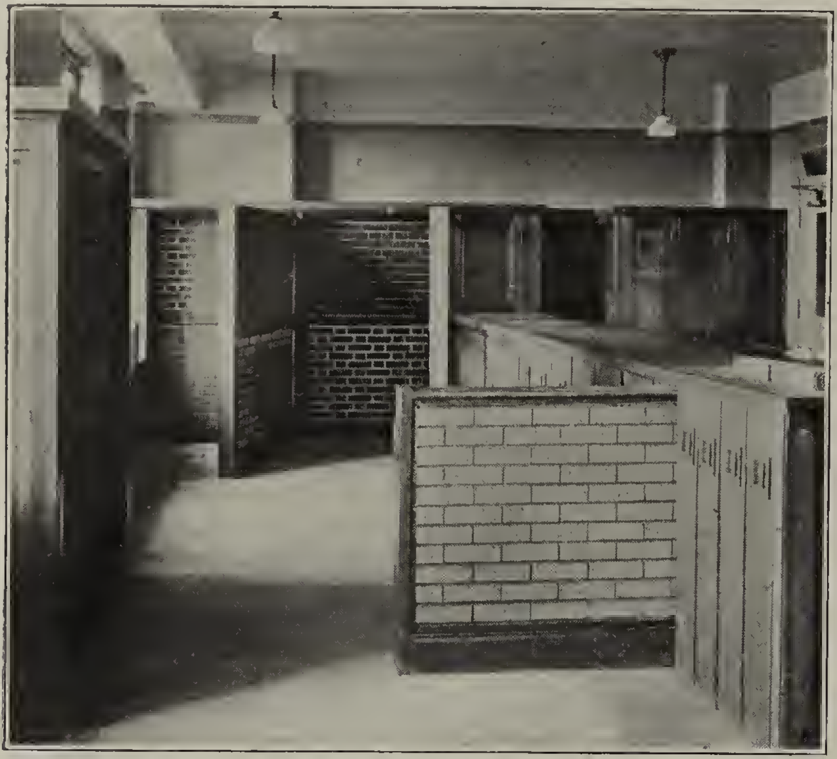
Departing from the old and universally recognized method of displaying and selling face-brick, the display room shown in the accompanying illustrations represents the origination of a face-brick salesmanager who saw in a reversal of customs an opportunity to increase sales and acquire more and better satisfied customers. It was planned and its construction supervised by F. B. Martin of the Twin City Brick Company, Minneapolis, Minn., a pioneer in the Northwestern Clay Association and one of the livest brick enthusiasts in the clay-working fraternity. The idea bids fair to revolutionize the method of displaying face-brick.

In sharp contrast to the ordinary display room, the atmosphere of Mr. Martin's office is one of restfulness and ease, every effort having been put forth to bring about this result.

By far the most prominent material that meets the eye of the visitor or customer upon entrance to the room is the woodwork in which the room is finished. Being of an oil finished oak, in which has been placed just a touch of gray to bring about a neutralizing effect, it produces a very quiet tone. With this exception, every other office in the building, the largest of its kind in the Northwest, is trimmed with mahogany, so it was only after considerable effort that permission was gained for the use of oak in the trim of this particular room.

The quiet tone is carried out to a nicety by the neutral gray floor, surrounded by a double border of gray brick, laid flat, constructed at great expense to harmonize with the rest of the room. The walls, or rather that part visible above the woodwork is finished in dull colors harmonizing well with those of the floor and trimmings.

The large majority of the brick are out of sight, placed so by two means. One of these is a sliding frame arrangement and the other a swinging door. The sliding frames are planned along two different lines, there being a double and a single panel type. The single panel style is, in turn, designed in two different ways—that which carries but one panel of brick and runs into the receiving case at an angle and that which carries two panels, one on each side, and is inserted at right angles into the case.



A Panel That Emerges At Right Angles to the Case, in the Foreground, While in the Background is Shown the Swinging Door Arrangement of Displaying Six Panels in the Space Usually Occupied by Two

CONSTRUCTION OF SLIDING FRAMES IS SIMPLE

The construction of the sliding frames is comparatively simple after the principle has been mastered. Along the north wall of the room is the largest case, concealing twelve of the larger frames. Each frame carries two panels of brick, eleven high and five wide, which are inserted into the case at an angle of forty-five degrees. A set of steel rollers consisting of four pairs that run in a track made by laying two strips of metal from next to the wall to well outside of the case, leaving a narrow space between them in which the wheels run, make it comparatively easy to draw the big frame from its place to display the brick contained in its panels and to replace it when it is not needed. Small steel handles of neat design are fastened to every panel at a uniform distance from the floor.

ONE-PANEL FRAMES ALSO EASILY BUILT

The construction of the smaller frames is much the same as the larger ones, that of the one inserted at right angles being slightly different from the construction of the cases at an angle. These frames are built just high enough to accommodate one panel and are inserted into a case that not only provides for their reception but also acts as a counter of presentable proportions. The weight being less than that of the larger frames, but two sets of wheels, without the tracks, are needed. The frame inserted at right angles is able to carry two panels of brick because it receives the light equally as well from both sides, being opposite to the wall and between two windows. The single panel type of small frame is on the other hand so placed that it gets a better light from one side and is inserted into the case so that, when pulled out, the displayed brick will receive a direct light.

It is readily seen that these panels may be pulled out the entire distance or just part way. This makes it possible, in displaying the brick, to show the exact appearance of a finished pier in any thickness less than that of the panel itself.

WHERE BRICK ARE DISPLAYED ON DOORS

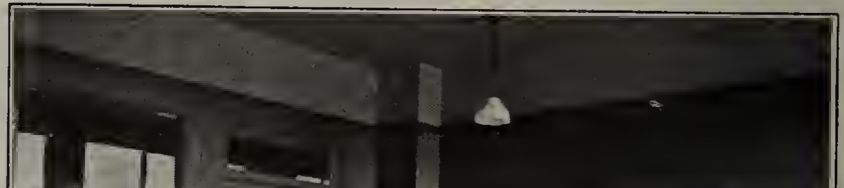
The swinging door panel frames are equally as noteworthy as those above described and consist of two different sizes, that carrying two panels and that which carries one. Running on rollers that facilitate their motion, these doors may be swung open in the same manner as the ordinary door and, when drawn back, reveal on the inside of the swinging part another set of panels, making, in the case of the two panel style, four different panels carried by the door itself. Not only is the space upon the interior of the door utilized, but upon that portion of the wall or interior of the cabinet revealed by the open door is displayed one or two more panels, as the case may be.

By swinging open a door that occupies the space ordinarily taken up by two panels, six different panels are displayed, and so arranged that each panel gets the benefit of a full, direct light admitted during the entire day thru spacious east windows eight stories from the ground.

ALL PANELS ARE INTERCHANGEABLE

All of the panels of both the sliding frames and the swinging doors are of the same size, so that they are interchangeable. The panels are not laid up directly into the display space of the frames but in an inside frame of the same material as the rest of the case. Thus, the panels need not be destroyed when removed, but taken out in the smaller frame and placed in the stockroom or into a different position in the display room. A very elastic exhibit is obtained in this manner, making it possible to change the panels at will without unwarranted trouble and to place the brick that are not to be shown either in less prominent positions in the display room or taking them out of the frames entirely and replacing them with another and more desirable brick.

The tremendous saving in space made possible by the use of this system is, in itself, a great argument in its favor. Here, in an office much smaller than the usual brick salesroom, are displayed sixty-six full sized panels of face-brick. The large case along the wall has a capacity of twenty-four panels and takes up only an amount of space that would ordinarily be used in displaying but six panels. In the case of the smaller frame that accommodates two panels of brick and is inserted into the case at right angles, ten different



The Large, Double Panel Frames That Have Many Advantages in Addition to a Saving in Space panels are displayed on five frames in a space that would under ordinary circumstances be taken up by one-half of a panel. Six of the single panel frames occupy but one-third of the space it would take if the brick were displayed by laying them up against the wall flat.

The space saving features of the swinging doors are very apparent, the smaller ones carrying three panels in the wall space of one and the larger type accommodating six and occupying a wall space of but two.

CUSTOMER IS NOT BEWILDERED

However, the space saving feature of this room is but one of its many advantages. The customer, upon entering is not bewildered by a large number of brightly colored panels. There is a refinement of finish that is to be found in show rooms of the highest order that makes him feel at ease. He sees only the panel the salesman wishes to show him and is able to concentrate his attention upon it. The walls, floor and trimming, being of a monotone and much more neutral in color than any face-brick, are all complimentary to the displayed panel.

In this manner, knowing the desires of the customer, the salesman is able to display the preferred brick in differently colored mortar joints or other bonds, and have the attention of the buyer fixed upon the brick that is being displayed. This not only results in a quicker sale but enables the customer to better realize the difference the joint makes in the appearance of the finished wall and the effect produced by the various bonds.

In this connection it might be mentioned that the average buyer of face-brick, as every salesman knows, finds it difficult to carry a color combination in his mind. Having seen a certain brick in a building he comes into a brick office with his wife, who has also seen the brick, contemplating the purchase of a similar one to be used in the construction of their home. Seeing practically every brick carried in stock upon the wall, and every joint and bond spread out in close proximity to each other, they find it hard to say which is the desired brick. Many a family disagreement has been witnessed in the brick sales office when the husband insists that the yellow looking brick on top is the desired material, while his wife is equally as determined that the gray brick with the cream-colored mortar joint at the other end of the room is the one.

It is easily seen, therefore, that the buyer of face-brick needs every help in selecting his brick, and to enable him to recognize the color scheme desired with reasonable accuracy. A system that provides for his undivided attention upon one panel of brick at a time will do much in the way of helping him. It is really a case of selling by elimination. By permitting concentration those panels that are unsuitable may be left unseen and the attention centralized upon the three or four that can be used. And from these it becomes a comparatively easy task to select the most desirable.

The Swinging Door Panels, When Closed, Keep from View Other Panels Which the Salesman, for Some Good Reason, May not Care to Show

SALES MADE IN HALF THE TIME

According to Mr. Martin, sales are made in half the time that was taken under the old method. The customers are found to be strongly in favor of the new type and take pleasure in choosing their brick in this manner.

One of the main reasons for its success is the fact that architects have shown a decided liking for it. By making the sales to the builder quicker, it conserves their time and patience.

Accordingly, a large increase in sales over the corresponding period of last year has been made by this company, confirming the fact the display room which has introduced common-sense into the selling of face-brick has proved a great success.

SPICY SUGGESTIONS *for the* SALESMANAGER

Permanent connections lend strength to an established concern. The house that is selling the same brand of goods it has always sold is able to point to this connection as double proof of the quality of the goods and the character of its service.

In the business of selling brick the tendency has often been to change from one line to another without good reason. Often this is the result of the desire of a manufacturer to get a dealer who is supposed to be able to deliver more business, to take on his particular product, or the dealer may make what appears to be a more favorable arrangement with some other manufacturer on a competitive proposition, and then cut off his first connection.

These changes are sometimes necessary, but the burden of proof is with them and in favor of retaining the old connections. The fact that a dealer is constantly showing something different may suggest to the buyer a lack of belief in his (the dealer's) goods and for this reason makes selling difficult.

Sometimes a good salesman is able to control an agency. In one case with which the writer is familiar a leading brick manufacturer has shifted his agency in that particular market three times as the salesman in whom he had confidence changed his position. This suggests, too, that the dealer who has a good salesman ought to make this man's job attractive enough to hold him, just as he should endeavor to keep his lines uniform. No one is benefited by too many and ill-considered changes of lines and sales representatives.

Salesman's Chips

Courtesy is the lubrication which allows folk to mingle together without knocking corners off—a finish that requires no rubbing oil.

You can only reveal your best self by marketing your best goods.

The buyer has a good memory—he remembers promised delivery dates and loses confidence when the promise is violated.

A good job and a bad man are soon parted.

Give some salesmen enough note paper and a good listener and they'll tell you all they know.

Every time a salesman disrupts his house's policies he requires supervision. That cost would otherwise be added to his salary.

Life shouldn't be taken too seriously—you can't get out of it alive.

Some efficiency men look, listen—and then stop.

Many a concern is carried on by the momentum of the past.

God never willed that the success or failure of an undertaking depended upon one man alone.—Karl Lemmerman in "National Petroleum News."

Another Valuable Phone Number Advertising Idea

In the "Salesmanager" department of the June 6 issue, under the head "Tell the Trade Your Telephone Number," appeared a suggestion which urged the necessity of keeping customers informed of the number they should call when desiring to place an order for clay products. A particular instance was cited of the manner in which one prosperous dealer handled the problem. Having the same number on both the independent and the Bell lines, he advertised it extensively as the one number the public should call when in need of brick or hollow-tile.

THE NEW ONE
Omaha Made
Quivera Matts

THE OLD STAND-BY
Omaha Made
No. 550 Iron Spots

FACE BRICK
PHONE NUMBERS

Don't waste time looking up our phone number in the telephone directory

SAVE THIS CARD

OFFICE, 1302 W. O. W. Bldg. . Doug. 907 (Change)
CITY YARD, 13th and Webster Sts. Doug. 6800 (New)
WEST YARD, 43rd and Nicholas, Walnut 444
BRICK PLANT, Avery, Nebr. . . South 942

For early morning rush orders, call our West Yard or City Yard any time after 7 a. m.—Office after 8 a. m.

After business hours, orders will be given attention by calling

Mr. Besley	at Harney 2580
Mr. Ring	" Harney 2628
Mr. Ownby	" Doug. 802
Mr. Parker	" Harney 3659
Mr. Grace	" Walnut 3102
Mr. Richardson	" South 2625
Mr. Merriman	" South 3014 (Plant orders)

Yours for More and More Hy-tex,

HYDRAULIC-PRESS BRICK CO.

The Hydraulic-Press Brick Company of Omaha, Neb., however, submits the idea covered in the accompanying illustration as going the above mentioned suggestion "one better." This consists of a card measuring three and one-half by seven inches given over entirely to phone-number publicity, telling of the numbers that, if called, will bring the office, plant or either of the two yards to the service of the customer. Also the numbers to be called when it is desired to place an order early in the morning, before the office is open, for immediately delivery. Further than this however, the numbers of those in charge in the plant and at the office are listed where attention will be given to orders after business hours.

"Don't waste time looking up our phone number in the telephone directory—SAVE THIS CARD" is a strong appeal that will not fail to make many contractors or other buyers of brick puncture the wall in their offices with a tack driven thru the little hole at the top of the card.

Important Freight Tariff News from Washington

The Interstate Commerce Commission has handed down its decision in the case of the Chattanooga (Tenn.) Sewer Pipe and Fire Brick Company, against the Central of Georgia Railway Company, et al. In their syllabus in this case, the commissioners says:

"Rate of 16.8 cents per hundred pounds charged by defendants for the transportation of hollow fireproofing building tile in carloads from Chattanooga, Tenn., to Valdosta, Ga., not found unreasonable, unjustly discriminatory, or in violation of the rules of the fourth section. Complaint dismissed."

The commissioners have also announced recently that they have suspended until Spetember 29, the operation of certain items appearing in tariffs of Eugene Morris and E. B. Boyd, agents.

The suspended items name new joint commodity rates applicable to the transportation of brick and articles taking the same rates from various points of origin in central freight association territory to Saulte Ste. Marie, Ont. The proposed thru rates are in excess of the sums of the intermediate rates. The proposed thru rate from Cincinnati, Ohio, is $3.24 per net ton. The combination rate is $3.14 per net ton based on a rate of $2.84 to Saulte Ste. Marie, Mich., plus thirty cents per ton beyond.

Brick a Favorite in Ohio Paving Program

Contracts are being awarded by the Ohio Highway Commission for approximately eighty-two miles of improved roadway in the Buckeye state upon bids opened by the department May 19. A number of the improvements consists of brick paving, which is becoming more popular with each passing year. In Athens county a section of a mile and a half of the Logan-Athens road is to be paved with brick, while a section of the Salem-Alliance road in Columbiana county is also to be paved with brick. A part of the Lima-Sandusky road, two and one-half miles in length in Hancock county, is to be improved with brick paving of the monolithic type. About a mile of the Barberton-Greenwich road in Huron county is to be improved in the same manner. A section of the Bellevue-Norwalk road will be paved with brick and concrete. Sections of roads in Knox, Richland, Miami, Union, Wayne and Wyandot counties will also be paved with brick. Many of the bids received were below the estimates of the commission's engineers.

Prompt Shipment Slogan of Detroit Concern

H. A. Benjamin, secretary-treasurer and general manger of the Puritan Brick and Tile Company, with offices in the Farwell building, Detroit, Mich., said, when interviewed recently:

"One of the things we aim to give our customers is prompt shipment. This is an important factor in building up a successful brick business. The best advertisement a brick dealer can have is a reputation for making prompt deliveries. One shipment sells others."

The SUPERINTENDENT

Helpful Hints for Practical Men Whose Problem is Maximum Production With Minimum Cost

Simple Test of Coal

There is a simple form of test for coal that ought to be known to everyone interested in fuel. It is based on the quantity of pure lead that will be released from its oxide by a given weight of carbon. Litharge is oxide of lead and contains 34.5 units of lead to one of oxygen. When finely powdered coal mixed with oxide of lead is heated to the combining temperature, the oxygen of the compound unites with the carbon and leaves the metallic lead. The quantity of lead precipitated gives the means of determining how much carbon there was in the coal used.

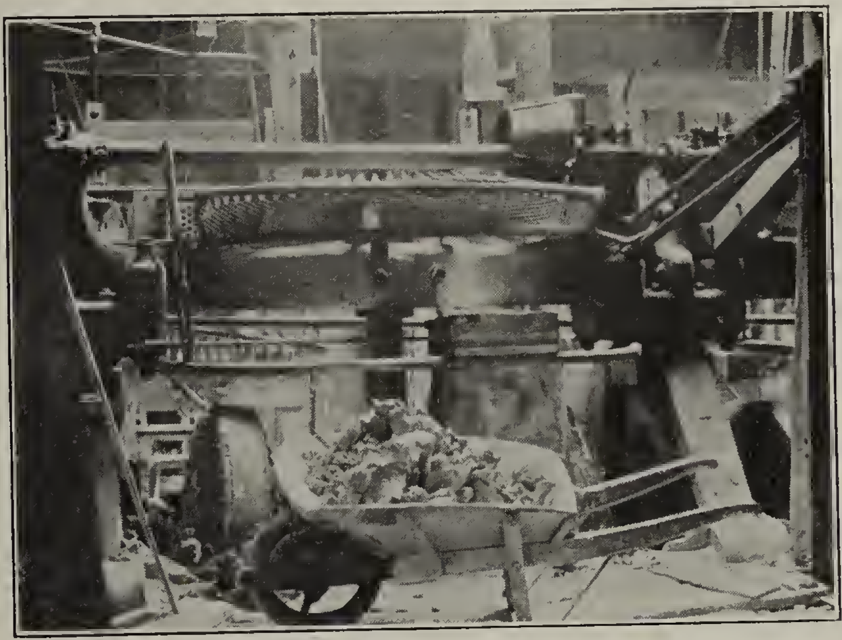
Let a sample of coal be heated with forty times its weight in pure litharge. The weight of the former will give a basis for ascertaining the purity of the coal. The weight of lead will vary from twenty to thirty times the weight of the coal. If the weight of the lead is twenty-five times the weight of the coal employed, the percentage of carbon in the coal will be about $25 \div 34.5$. This is not absolutely correct, but it is near enough for all practical purposes.—*Railway and Locomotive Engineering.*

Safeguarding the Wet Pan

While there may be a great deal of truth in the contention of some plant owners that ninety per cent. of the accidents in clayworking are due to pure carelessness, which no amount of safety devices and precautions can prevent, the fact still remains that the other ten per cent. are preventable and worthy of safety measures. One fatality which might have been avoided will more than offset all of the time, labor and expense put into the safeguarding of moving machinery and dangerous conditions.

The wet pan is not an uncommon piece of equipment on plants that have for their object the turning of raw clay into finished building materials. This machine may seem perfectly harmless to the sober, industrious and cautious workman, but there are times when a slip of the foot or the touching of a moving wheel or gear with the clothing might result in a very serious accident or even death to the unfortunate workman.

Plant No. 2 of the Atlantic Terra Cotta Company at Perth Amboy, N. J., probably has not had more than one serious accident in a great many years, and yet those who are in charge at this plant have seen fit to safeguard the machinery so as to preclude any mishap which might occur thru a lack of protection. The method followed in guarding its wet pans, of which there are two at this particular plant, is shown in the accompanying illustration. A wire guard is placed around the large bevel gear on the top of the machine, while a sheet iron guard covers the smaller gear that propells the larger one. An iron pipe railing has also been placed around the pan, so that in case a man should slip on the floor he would have a chance to catch himself before being precipitated into the pan.

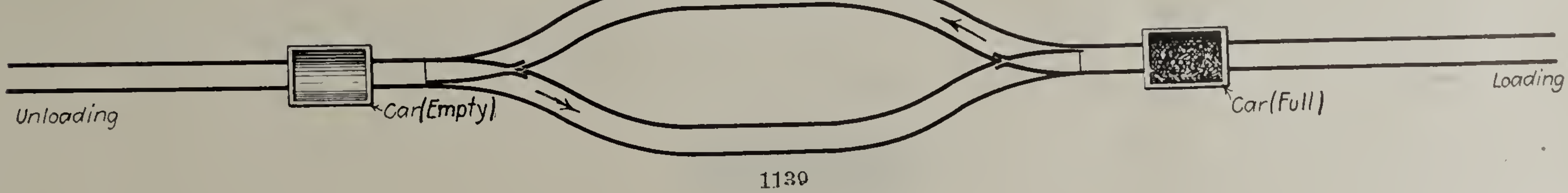


Another device, not shown in this illustration, but which is located to the right on the opposite side of the pan, protects a hole in the floor over a belt conveyor which is used to carry the wet clay from the pans to a pugmill. This hole is used in case the belt should refuse to work either because of being overloaded or by the clay sticking to the wooden sides of the covering over the belt. This hole is comparatively small, not more than a foot or a foot and a half square. It is covered by a trap door in the floor, which, when opened, causes an iron fencing to rise out of the floor and surround the opening while the door is raised. The idea of this fencing is to prevent a man from stepping into the hole and thus injuring himself. This safety device was invented by one of the men who works around the pans and is really very clever.

The same guards as are shown in the accompanying illustration should also find a ready application to dry pans, as their operation and hazards are quite similar.

Clay Cars That Throw Their Own Switches

Unusual plant conditions, together with the resourcefulness and ingenuity of a superintendent, have conspired to perfect the track layout shown in the accompanying illustration. Eliminating all of the mechanical switching devices and the man that is usually stationed to operate them for the approaching clay car, this system makes it possible for the car



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itself to supply all of the necessary energy in providing for its passage over the switching track which accommodates a second car.

The unusual conditions referred to have made this system especially profitable on the plant in question, but its adaptability to all layouts is accepted without question. This plant is so constructed and situated that the pit is higher than the machine room. The supplying of clay to the receiving hopper then becomes an extremely simple matter as gravity is the only power necessary. An empty car, stationed below the loading platform upon which the dragline excavator deposits its load, receives the clay that falls thru a hole in the floor of the platform. At the time that this car is being filled, the other is being emptied at the machine room. The two are connected with an endless cable (not shown in the illustration) and pass each other on the double track that is placed exactly half way between the loading and discharging platforms.

Thus, when the brakes are released, the loaded car, being on a higher level than the empty one, runs down the incline by force of gravity. Just as the loaded car strikes the switch at the end nearest the loading platform, the empty car hits the switch nearest the discharging end and the cars pass each other at the middle of their respective tracks.

When the loaded car has passed the first switch, the latter is left open for that track, but as the empty car passes over it on its way to the loading platform, it throws this same switch in such a manner that it is left open for the track upon which the empty car came up. Thus, when this same car is going down, after having been filled, it follows the track upon which it approached the loading station.

The same is true of the other car. After being filled it was allowed to run down over the switching track to the dumping end and, in so doing, threw the switch at the end nearest to the dumping platform that had been left closed by the car that just passed over it, in such a position that the track is open for its passage over the same switching track when it is drawn up by the loaded car.

The cars, therefore, are kept on their own tracks—the one car, whether loaded or empty always traveling over the same switching track and the other car passing over the other track. The cars follow this route because they throw the switches as they pass over them for either the filling or discharging ends, lining up the route for the return trip.

There is no doubt but that this idea can be used on a great many clay plants. It is not necessary that gravity supply the power that sends the loaded car into the receiving room. The plant using electric or steam power can adopt the scheme in its entirety. All that is necessary is that the passing tracks be located at such a point that both cars are on them at the same time in order that, as the car going to the machine room makes the proper adjustment of the switch at one end for its return, the car going in the opposite direction performs a like operation on the switch at its end of the passing track.

It takes a mighty rusty switch to resist the power of the passing car. If the customary springs were used on these switches the usual difficulties that accompany them would be experienced. Here, this trouble has been entirely obviated, besides eliminating the expense of maintaining an extra man, which is done on many plants, to operate the switches so that the cars can pass on their proper tracks. Or at least, it relieves a workman of that duty who might be doing something more profitable around the pit.

Shooting Soot from Stacks

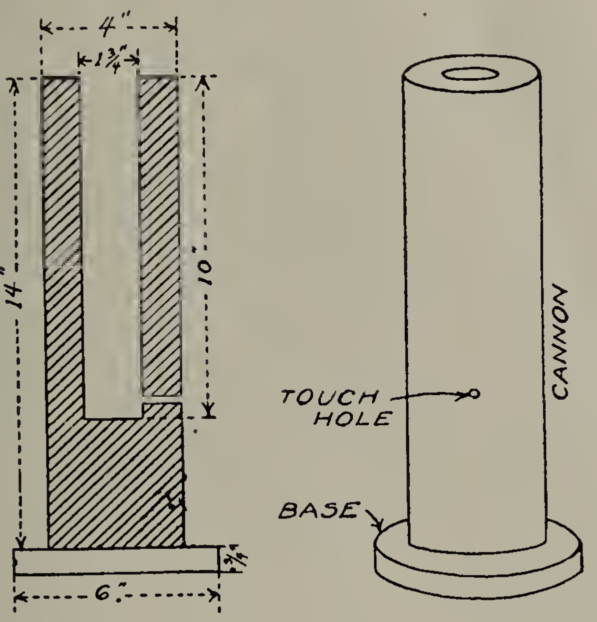
In many industrial plants there are large smoke or kiln stacks. These stacks often become clogged, or partly so, on account of the soot adhering to the inner lining. It is necessary, in order to maintain draft, that the stacks be cleaned frequently.

A simple, economical and most efficient method of accomplishing this is to "shoot" the stack with a "stack gun" and blasting powder. This "gun" can be used in cleaning either lined or unlined stacks, brick or steel, without fear of injury to the stack or lining.

The gun can be made out of an old piece of shafting about four inches in diameter and from fourteen to sixteen inches long. Bore a hole one and three-quarters inches in diameter and ten inches long in the center of the piece. Then bore a small horizontal hole one-fourth inch in diameter thru the piece to the bottom of the center bore. This hole serves as a touch hole for inserting the fuse.

The whole thing can be mounted on a pedestal about six inches in diameter so that it will stand in an upright position, as shown in the accompanying illustration.

The method of operation is as follows: Pour some blasting powder into the mouth of the cannon to about two inches from the top. Tamp to the collar with dry clay. A short piece of fuse is inserted in the touch hole and in contact with the main powder charge. Open the flue door at the bottom of the stack, light the fuse and close the door.



The explosion shakes and loosens the soot adhering to the sides, causing it to fall to the bottom. It can then be removed thru the flue opening.

A charge of eight inches of powder, one and three-fourths inches in diameter, is sufficient for a stack up to one hundred feet high, and four feet in diameter, or over. The number of shots necessary to thoroly clean a stack depends upon its condition. Ordinarily, three or four shots will clean a stack, but if very dirty it may require more. The size of the stack and length of the cannon can be regulated to suit the height and diameter of the stack.

There is no doubt about the efficiency of this "gun" for cleaning smokestacks. One of the largest manufacturing concerns in the country has used this method for several years, without an accident or injury in any way to the stacks.—S. R. Russell.

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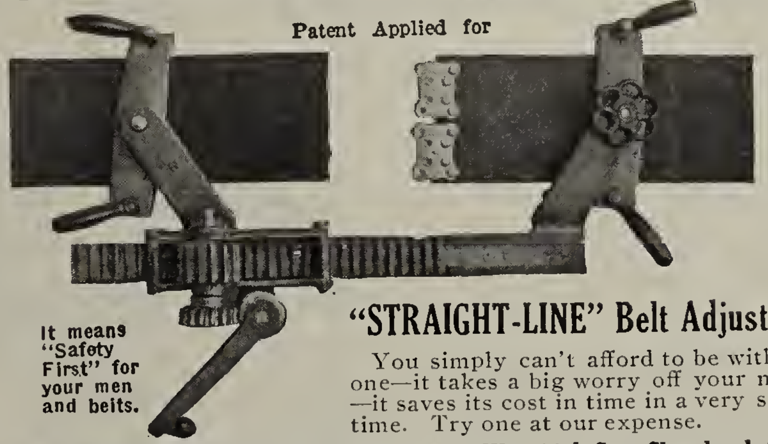

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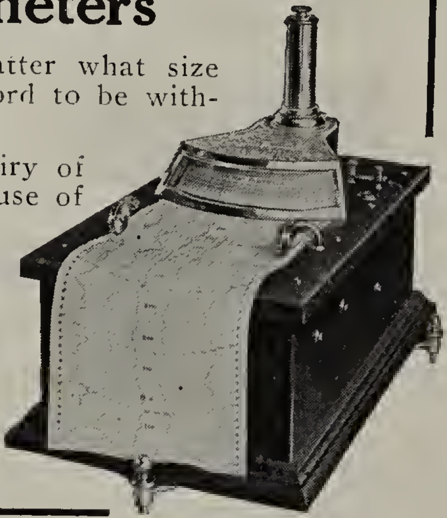

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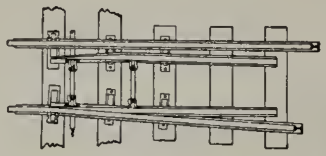

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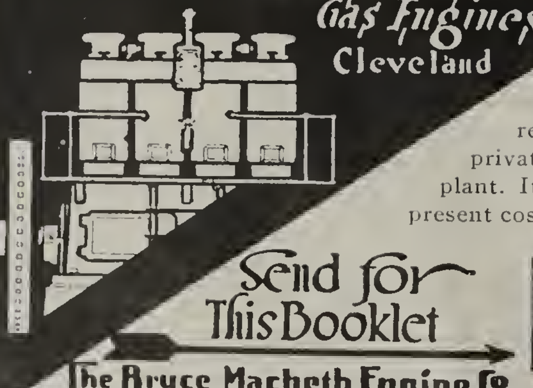

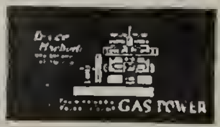

QUESTIONS

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Address all communications intended for this department to "Editor, Questions and Answers," care of "Brick and Clay Record," Chicago.

Cold Place in Center of Scove Kiln

776. *Oklahoma—I am burning an up-draft kiln and after three days of settling heat, I discovered that I had a black streak in one of my arches about the center, and about five arches from the end of the kiln. I went on top and found that I had a cold place about ten feet square, as cold as the day the brick were set, and running to the arch. What looked so funny was that the brick on all sides were red hot. I have been trying to get this cold spot hot for two days but have not been able to do so. Could you tell me the cause of this? The brick are settling fine all around this cold place.*

It is extremely difficult to determine at this distance just what the trouble is with your kiln, because there are so many conditions that enter into a matter of this kind. From your description we should say that the difficulty comes from one of two things: viz., tight setting in the particular part of the kiln which will not heat up, or the setting of wet brick in that spot. If the setting was too tight, it would cut the draft there giving trouble, and thus allowing the balance of the kiln, and especially that part around the cold spot, to get ahead. Once such a condition was started, the heat would be drawn away from the cold spot thus letting it get in a comparatively worse condition as time went on. Tight setting, however, would more than likely cause the heat to concentrate in the arch below it, in which case, it is more than probable that some of the brick in the arch would be pulled down, unless it was possible for the heat to escape thru the legs on each side.

If wet brick were set in the troublesome part of the kiln, the symptoms would be very much the same as in the case of tight setting. While the wet brick were being dried out, the balance of the brick around the cold place would be heating up, and as a result the troublesome section would get behind at the start and the heat would be drawn away into the hotter portions of the kiln instead of touching it.

Air leaks in the scoving or walls of kilns are sometimes responsible for cold spots in a kiln, but since you say nothing about such a condition, we presume that it is not due to this cause. From the information you have given us we can see no reason for your trouble other than tight setting or wet brick.

Oil Versus Wood for Burning Brick

784. *Texas—We would like to know how crude oil compares with wood for burning common-brick in up-draft scove kilns. For instance, how much oil does it take to burn a thousand brick and how much pine wood under ordinary conditions? We are installing a thirty to forty thousand common-brick plant, stiff mud process. We have both pine wood and*

and ANSWERS

Best Authorities in Every Clayworking Branch are Called into Consultation — Their Advice is Free to You, Thru These Columns

Should a reply be desired by letter, send a stamped and addressed envelope with your question, and it will be answered promptly.

---

oil fields near our plant. Wood can be had delivered for $1.25 *per cord and oil for* $1.20 *per barrel.*

Judging from the fact that you can have delivered at your plant pine wood at a cost of $1.25 per cord and oil at $1.20 per barrel—which, we take it, means the standard barrel of forty-two gallons or three hundred and ten pounds—it appears, upon investigation, that oil would be the cheaper of the two fuels to use.

The results of extensive experiments have shown that wood at $1.25 per cord is equal in heating value to oil at $.0336 a gallon. From this it can readily be seen that you would have to pay $1.38 for the amount of wood that has the same heating value as the oil which you can obtain for $1.20 per barrel.

These results are based upon pine wood having a heating value of 7,272 B. t. u.'s per pound and oil having a heating value of 19,200 B. t. u.'s per pound and weighing 7.4 pounds to the gallon. All wood has the same heating value per pound. The available heat units in wood, or that part of the fuel that can be utilized in the burning of brick, is sixty-seven per cent., while the available heat units in oil amounts to ninety-six per cent.

It is also true that it is more economical to use oil wherever possible, if the cost is not too high, due to the advantage that it has over wood in handling and in the time consumed in burning. A saving is also effected by the use of oil because comparatively no arch brick are broken by firing with this type of fuel, as is the case with wood, the breakage being occasioned by throwing the wood into the arches. Due to the more uniform burn that is possible with oil, because it gives a constant heat, less loss in salable ware is sustained and, in many cases, a better product is obtained.

Some idea of the esteem with which oil as a fuel is held by some plant owners may be obtained from the fact that, while the price of oil in Chicago is quite high at the present time, yet all of the common-brick companies in that city are using it for burning their product.

Has Trouble with Semi-Continuous Kiln Crowns

770. *Quebec—We have a semi-continuous kiln with chambers twenty-eight feet ten inches long by fifteen feet wide, with walls six feet from the floor level to the spring of the arch and with a height of four feet six inches from this latter level to the top of the crown. We have a great deal of trouble with the crown and feel that it may possibly be due to its being too flat. Are we right in this conjecture? If so, what should be the proper height of the crown?*

In the absence of additional data, we were able to forward but a limited answer to the reader who sent in the above question. This answer was published in the May 2 issue.

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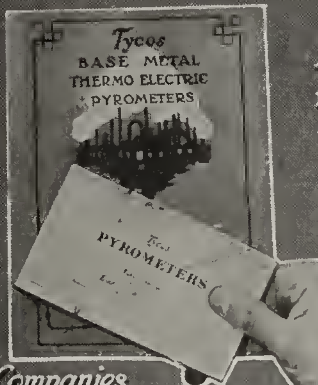
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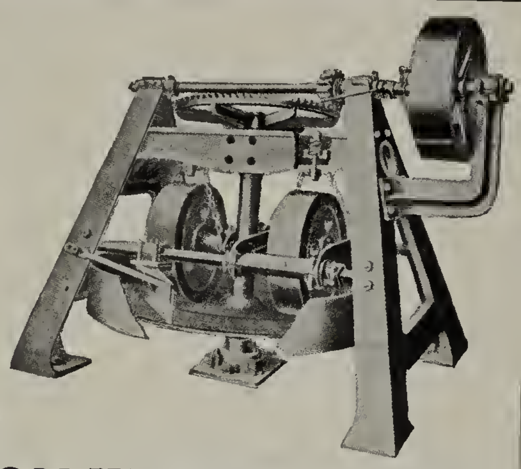

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Since that time, and upon our request, this reader has written us giving further information, particularly with regard to the nature of the trouble he is having with the crown on his kiln, as follows:

We do not know that we can add much to what we have have already said except to say that the crown splits about four feet from the spring of the arch on the firing side and gradually pushes in, thus getting out of shape. After a time this gets so bad that the crown, if not repaired, will fall in when cooling and, in order to keep it safe at all points, it has to be rebuilt about every second year. We have been very particular about the laying and so do not think that our trouble is caused by careless masonry.

It is to be presumed from the question that the kiln under discussion is of the semi-continuous, one side, gas-fired type. If this is the case, experience has shown that the ordinary rules of design and construction of crowns are not applicable to this type of kiln. The fire being all on one side, subjects the crown above the bagwall to far greater heat than any other portion. The exposed part of the crown is, therefore, subjected to excessive shrinkage, softening and expansion, and the result is that a small section of the crown above the bag gradually sags and, therefore, pushes the balance of the crown out of circle.

Upon further thought we would say that your crown is unquestionably too low with its rise of only four feet, six inches. An increase in the rise of six inches, making a total rise of five feet, would be more correct.

While you state that the utmost care has been used in the construction of this crown, it is not quite clear that the exact proportion of squares and wedges are always used. Naturally, this is very important if the crown is to stand up for any length of time.

While increasing the rise of the crown to five feet will improve conditions materially, there is hardly a question that a long life crown cannot be built on this type of kiln with nine-inch brick. The thickness of the crown is simply not great enough to stand up under the conditions imposed upon it. If a lasting, satisfactory and, in the end, cheap crown is to be had, it must be constructed of 13½-inch blocks. These blocks can be at least 6x6x13½ inches in size and, of course, must be made to order for the crown on which they are to be used. They must be of good material and hard burned.

Such a crown, of course, is more expensive than that which has been used on this kiln, and its adoption would preclude the use of old brick which are probably used over and over again when the crowns are rebuilt. Considering the fact, however, that in Quebec the rebuilding of this crown every few years costs from three to five hundred dollars each, and as there are probably ten or twelve chambers, the first cost of the block crown would soon be covered.

Expansion Joints In a Chamber Kiln

785. *California—Where is the proper place to leave the expansion joints in a chamber continuous kiln for high heat or fire brick purposes—in the kiln walls or in the arches? Is it necessary to leave any expansion joints in the chamber kiln?*

Some very good information regarding the above question was published in the April 18 issue of "Brick and Clay Record" on page 730, also on page 921 of the May 16 issue. For the benefit of those readers who do not have these copies handy, we are repeating below those portions of the article by A. F. Greaves-Walker on "The Design and Construction of Continuous Kilns," wherein was contained the information desired by our correspondent.

"Both straight buckstayed and battered walls are used in the construction of the side walls of the chamber kiln. When battered walls are specified, the construction should be carried out in exactly the same way as described for the tunnel kiln. The expansion joints should be located at the points where the cross walls separate the chambers and set into the side walls, as shown in Fig. 9. The same construction is used in straight wall kilns."

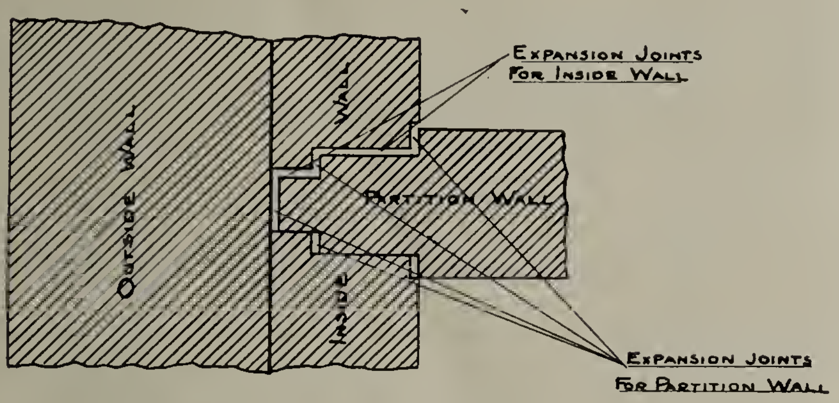
Expansion Joints For Inside Wall
Outside Wall
Wall
Partition Wall
Inside
Expansion Joints For Partition Wall

Fig 9 – Detail of Expansion Joints For Chamber Kiln

We also quote from the May 16 issue, page 921, what Mr. Greaves-Walker has to say regarding the placing of expansion joints in the crown of a continuous kiln.

"Expansion joints two inches wide should be left in the crown every twenty feet at the same points at which the expansion joints in the lining occur. These joints should extend thru the nine-inch crown only. The 4½-inch false crown should cover the joints in the nine-inch crown but should have one-inch expansion joints left in it at other points twenty feet apart. On top of this joint a rowlock of brick should be laid as in Fig. 20. If the expansion joints extend thru the entire crown and are merely covered with a rowlock, trouble is almost certain to occur within a year or two. The constant movement of the crown shifts the loose brick covering the joints and finally one or more drop into them and wedge them apart, resulting in the shifting of the entire crown. Moreover, as the brick covering shifts the earth filling begins to work its way into the joints with the same result. At the points where the false crown covers the expansion joints, firebrick should be used instead of common-brick if the temperatures to be attained warrant it."

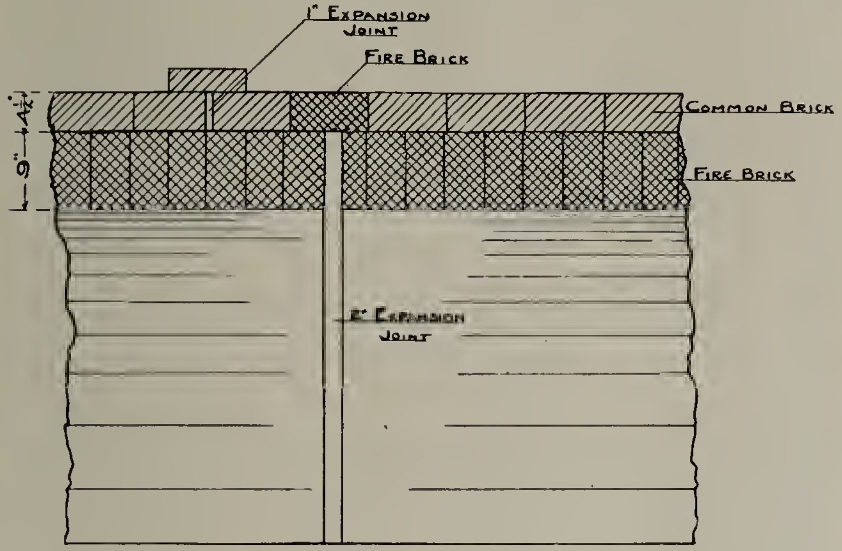

Fig 20 – Section of Crown Showing Expansion Joints

With regard to leaving expansion joints in a chamber kiln, we would say that this certainly should be done.

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Will handle doors from 2' to 8' wide and 5' to 8' high. Made for wood or fireproof construction.
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Sold on 60-day trial.

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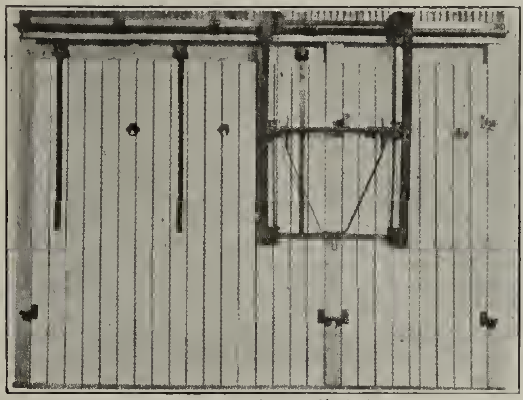
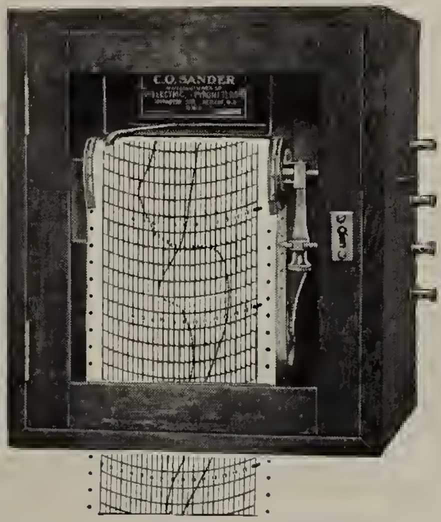


Showing "Carrier" Idle.



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Guesswork means poorly burned ware, with a corresponding big waste.
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As required for BRICK MAKERS USES.

PERFORATED SHEET METALS OF EVERY DESCRIPTION
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Pyrometer Equipment

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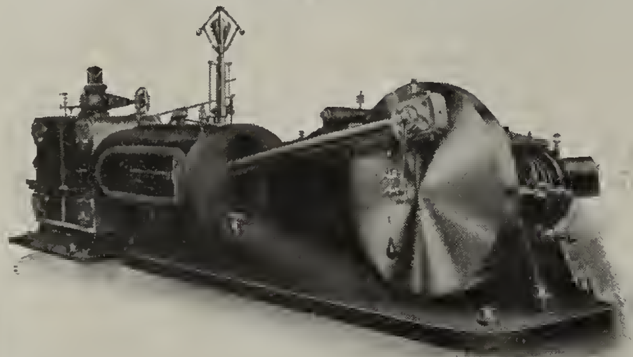

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No order too large to handle promptly or too small to secure immediate attention.

The Semi-Monthly Trade Review

IN MAKING ITS SWEEP over the months of this year that have already passed, Time is leaving a record of unprecedented building operations. Here and there a few minor retrogressions and drops in the curve of activity may be noted, but they are few, the market thus far presenting a most optimistic record for the manufacturer of burned clay materials.

The causes of the few drops that have been experienced by the building trade are mainly inclement weather and labor disputes. While man has no control over the former, yet seeming to have realized the blight he has been casting on the fair hopes of builders, the weather man has reversed a few of his levers, resulting in more sunshine and fewer clouds. Labor troubles, having made their annual demonstrative appearance on the national stage, have for the most part been settled. At the present time, therefore, both causes for declined activity have been removed and the future presents a rosy prospect.

MAY BREAKS ALL RECORDS IN VALUE OF BUILDING

There has only been one month in the history of this country—April, 1912—that has ever had a total above one hundred million dollars as the value of new building. The aggregate for May of this year, however, which amounts to $107,741,013, dwarfs this by several millions of dollars, with some twenty-three more cities yet to be heard from. Of added interest is the fact that the number of permits shows a large gain over the corresponding month of last year, only two groups of cities failing to show a larger number of permits issued, while every locality reports larger values than a year ago.

Following is a concise summary of the permits and values of building for the various sections of this country and Canada for the month of May this year and last:

Cities	No. of Cities	No. of Permits	Values	Increase in Permits	Increase in Value over 1915
New England	18	1,817	$ 7,107,182	24.8	28.0
Middle	27	6,392	39,458,466	1.5	18.5
Western	19	7,389	16,059,530	38.1	25.6
Northwest	16	4,100	28,891,034	22.7	92.6
Southwest	13	1,980	3,447,757	* 2.3	25.5
Southern	22	3,128	6,869,504	* .7	37.4
Far West	7	3,738	5,907,540	10.2	32.6
Total U. S.	132	28,544	$107,741,013	14.3	37.1
Canada	11	1,791	3,131,956	4.1	* 4.2

---

*Decrease.

There were 28,544 permits issued in 132 cities during May of this year, an increase of 14.3 per cent., while

the value of the permits totaled $107,741,013—a gain of 37.1 per cent. over May, 1915. Compared with the largest month of building ever before known, April, 1912, there was an increase of nearly five per cent. The percentage of increase in value over the corresponding month of last year is the heaviest recorded in any month so far this year, two-thirds of the cities reporting gains over the figures of 1915.

Of further interest is the fact that the addition of the large May total to the previous months' returns puts this year well up in the scale of building activities with the probability that 1916 may surpass all previous records for the full calendar year.

RAIN INTERFERES ON ATLANTIC COAST

Along the Atlantic Coast there has been little favorable weather during the past few weeks, with the result that work in that section has suffered at least one or two days' delay. Especially is this true of New York City where during the week of June 12th a succession of three days' rain brought trading in the brick market to a standstill.

Around Boston operations are unhampered. The towns surrounding this metropolis show heavy gains in residential building and farther out in the small industrial centers is reported unusually heavy construction, much of it being the mill type of building. Boston itself is the scene of an active building movement, results showing decided gains over corresponding periods of previous years.

Contractors and builders of Philadelphia, Pa., are reported as having enough business in hand to keep them busy for several months to come. Altho there was a slight falling off in the number of permits issued in the past two weeks, the excessively large amount taken out in previous weeks and months brings the total much above the average. There is an increase of about five million dollars in the value of the permits taken out at this point during the first five months of the present year, when compared to the same months of 1915. Much the same condition prevails at Pittsburgh, there being an advance in the value of permits taken out. Contractors at the last mentioned point, however, do not consider the condition as anything but fair and are in a position to handle more work. Much outside building is reported, including the construction of several industrial structures, important among which is an immense by-product coke plant that will use a large quantity of brick.

MIDDLE WEST ON HIGH SPEED

The larger cities of the Central States are experiencing a continuation of brisk conditions. Especially is this true of such points as Cleveland, Canton and Detroit, where brick manufacturers have been operating their plants to a record-breaking capacity in an effort to make enough material to supply the seemingly insatiable demands of the builders in these territories. While no definite figures are available for Cleveland, the general report is exceedingly satisfactory. In Canton a stupendous gain of one hundred and eighty per cent. has been made in the number of building permits issued during the first five months of this year over those of last. Possibly no other city in the country has a record that will equal that of Detroit, where a gain of about five million dollars has been made in the value of permits issued this year over 1915. This, in itself, is not so noteworthy as the fact that over $2,800,000 of that gain was

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Considering the service, they are more economical and far superior to the common metal seat types. Jenkins Bros. Valves have no metal-against-metal contact of seat; instead, there is the combination of brass raised seat and Jenkins renewable composition disc. The labor of regrinding is obviated. When repair is necessary, simply insert a new disc at expense of a few cents, and you have practically a new valve. Any dealer can supply. All genuine have diamond trade mark, as shown in the cut.

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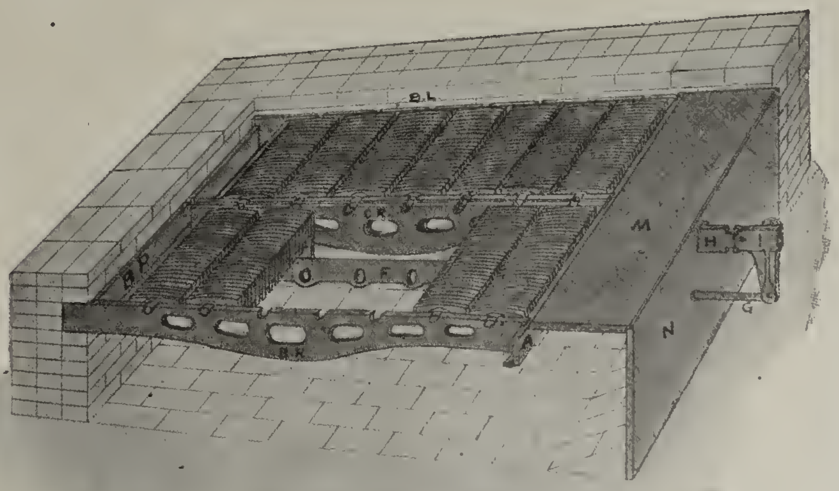
We guarantee that you will get more heat out of less fuel than you use now if you will adopt

CYCLONE BOILER GRATES

This is no mere statement—we back it up by offering to sell these grates to you on 90 days' trial.

Ask us to prove it—we take all the risk. Other brick companies rejoice now because we proved we were right. Will you?



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K-B PULVERIZER

Consumes only 10-15 h.p. to reduce 4-7 tons of stone, or 8-13 tons of clay per hour from 3″ to dust. Larger machines have the same high efficiency.

It is built entirely of steel and lined throughout with manganese hardened steel plates. It will endure the hardest service.

The hammers are adjustable to compensate for wear and to keep the product uniform.

Easy access is afforded to the inside of the pulverizer, as the screens slide out of the lower casing like drawers.

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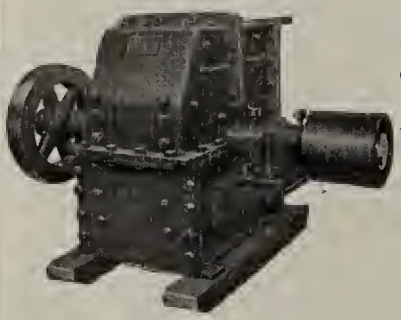

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The Cement for Paving Brick Grout

Lehigh is High in Strength, Uniform in Color and Fineness. You Don't Have to Guess with Lehigh.
Specify and Use Lehigh in all Brickwork. Remember the Mortar Joint is an Important Factor in the Wall.
Use Lehigh and Cease to Worry.
It Assures Satisfaction Under All Conditions.

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Cement Grout for Permanence.

registered during May alone. The fifth month of this year was most active in building in the city's history.

Figures submitted by the Columbus (Ohio) building department show that the present year, since January 1, has been a period of unparalleled prosperity. From January 1 to June 1 there was an increase of $1,525,000 in the value of buildings for which permits have been issued, over the same period last year. Thus far this year 13,093 permits have been issued against 11,063 for the first five months of last year. The total value represented by this year's permits is $3,604,065.

CINCINNATI ANTICIPATES BUSY SEASON

In and around Cincinnati, conditions are somewhat depressed because of a run of rainy weather that has had its effect on outside building and, consequently, on the demand for brick. A strike of common laborers at this point, while interfering with progress on small building operations, has been hardly noticed on the larger undertakings and is thought to be gradually "petering" out. General conditions remain excellent. The brickmen are looking forward to an active season when the coming of normal summer weather enables a resumption of operations on a scale that preceded the rainy spell.

LOUISVILLE PLANTS OPERATING TO CAPACITY

The last half of June finds the clay products manufacturers in Louisville and thruout Kentucky operating at capacity, with orders on hand or in immediate prospect that will keep the plants running until the season closes, according to reports received on all sides. Building under way is proceeding without interruption. There are numerous projects in Louisville as well as out in the state which will shortly develop into satisfactory orders for some brick salesmen. Work out in the state is producing a good deal of business for Louisville manufacturers and retailers and a large number of them are going after it with a great deal of vim.

While May of this year was much in advance of May, 1915, in Chicago building—the value of permits being $3,540,100 and $1,456,800 respectively—yet the early part of June was marked by considerable unfavorable weather.

Happily outside of the area of rainy weather, the cities of the Northwest are continuing to maintain the record set by previous weeks, this being the spring "boom" time of that locality. The Twin Cities are reporting an excellent state of affairs, especially Minneapolis, which has forged ahead of 1915 figures for building up to June 1, showing a gain of more than two million dollars. In Duluth, building during the month of May reached a total of $7,266,732, much larger than the total for the corresponding period of last year. This, however, includes one large permit taken out by the Minnesota steel company to cover the cost of work completed and under way at its plant at that point, over and above a $10,000,000 permit previously issued.

STRIKE THREATENS BUSINESS AT SAN FRANCISCO

Altho temporary obstacles are attempting to clog the wheels of building machinery on the Pacific Coast, yet conditions are satisfactory as a whole and clay products manufacturers forecast a continuance of good business. Much apprehension is being felt in San Francisco at the present time on account of the huge longshoreman's strike, which has just been declared. Unless brought to a speedy termination, it will seriously affect the clay products industry. With this exception, the building situation on the Coast remains on a very fair basis with prospects of considerable new work materializing in the near future. Terra cotta prices have advanced somewhat, but other clay products have remained about the same. The demand for brick is much better than that existing at the same time last year. Sewer-pipe is experiencing a slight backward movement. Lack of suburban extension work is the probable cause of this. However, municipal sewer work is being projected in different sections and with this in prospect, no doubt the demand will soon take a turn for the better.

IN *the* WAKE *of the* NEWS

Being Brief Mention of a Host of Interesting Happenings in the Varied Fields of Clayworking

Personal

F. W. Brower, formerly of Kilbourne, Wis., recently accepted the position of superintendent of the Barrington Steam Brick Company, Providence, R. I.

W. R. Simons, president of the Simons Brick Company, Los Angeles, Cal., was elected treasurer of the Builders' Exchange of that city at a meeting held recently.

J. P. Turpen recently joined the sales force of the Ironclay Brick Company, with general offices in the Ruggery building, Columbus, Ohio. Mr. Turpen succeeds William P. West, Jr., who resigned to take up other work.

George W. Washburn, a prominent brickmaker of Saugerties, N. Y., and president of the Washburn Brothers Company, died at his home on June 3 after a year's illness, at the age of seventy-four years. Mr. Washburn was born at Saugerties and for many years, together with his brothers, manufactured brick along the Hudson river.

George Francis, a pioneer brick manufacturer of southeastern Kansas, died suddenly of heart disease at his home in Coffeyville during the past month. Mr. Francis was vice-president of the Coffeyville Vitrified Brick and Tile Company and was credited with being the first man to discover the value of Kansas shales for brickmaking purposes.

California

Fresno, Cal., is considering the installation of a sanitary main sewer on North El Dorado street from Sonoma to Wyandotte streets.

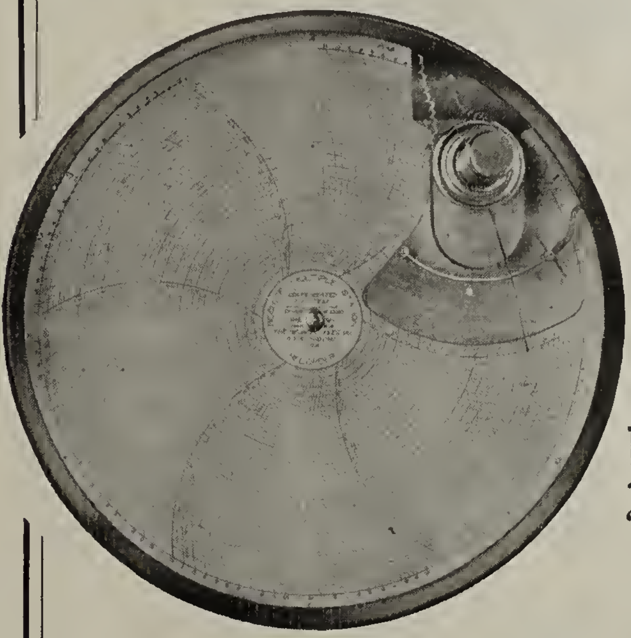
Stockton, Cal., will spend approximately $100,000 on a new sewerage disposal plant in the near future under a bond issue voted last year.

The brickyard at Atascadero, Cal., is to start operating this month. This plant employs twelve men and has a capacity of twenty thousand brick a day.

A report comes from Marysville, Cal., that the old brick plant between Ninth and Tenth streets of that city may soon be reopened. George Wapple of Yuba City, Cal., is contemplating its purchase.

The Board of Trustees at San Leandro, Cal., has instructed the city engineer to prepare plans and specifications for laying sewer-pipe on Williams street from the Southern Pacific right-of-way to the western city limits.

A mile of the Alum Rock Road near San Jose, Cal., is about to be laid with brick paving. In the event of



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See **how large** it is — **how plainly** it can be seen. This is **positive proof** against any errors in reading.

This is used exclusively on the

Beighlee

"The Pyrometer with a Conscience"

Any pyrometer will make records—but that isn't very much satisfaction to the brick maker who realizes the absolute necessity of knowing kiln temperatures exactly.

We will gladly tell you whom you can ask about the Beighlee if you'll write us.

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CLEVELAND, OHIO
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Representative in New England States

BALDWIN

You want a reliable, economical locomotive for service about your plant. Investigate the **Baldwin gasoline locomotive.**

These locomotives are reliable, because they are correctly designed and built. They are economical, because they consume no fuel while standing idle.

Record No. 74, which is yours for the asking, tells all about them.

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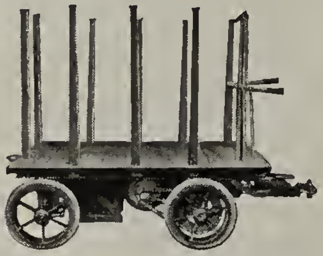
Transportation Equipment

Electromobile Industrial Trucks Tractors and Trailers pay for themselves in less than one year



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Write to our Engineering Department for data on cost-cutting equipment for your plant.

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New York Chicago San Francisco Pittsburgh
Branches throughout the world.
The "Electromobile" Electrically Driven Industrial Truck.

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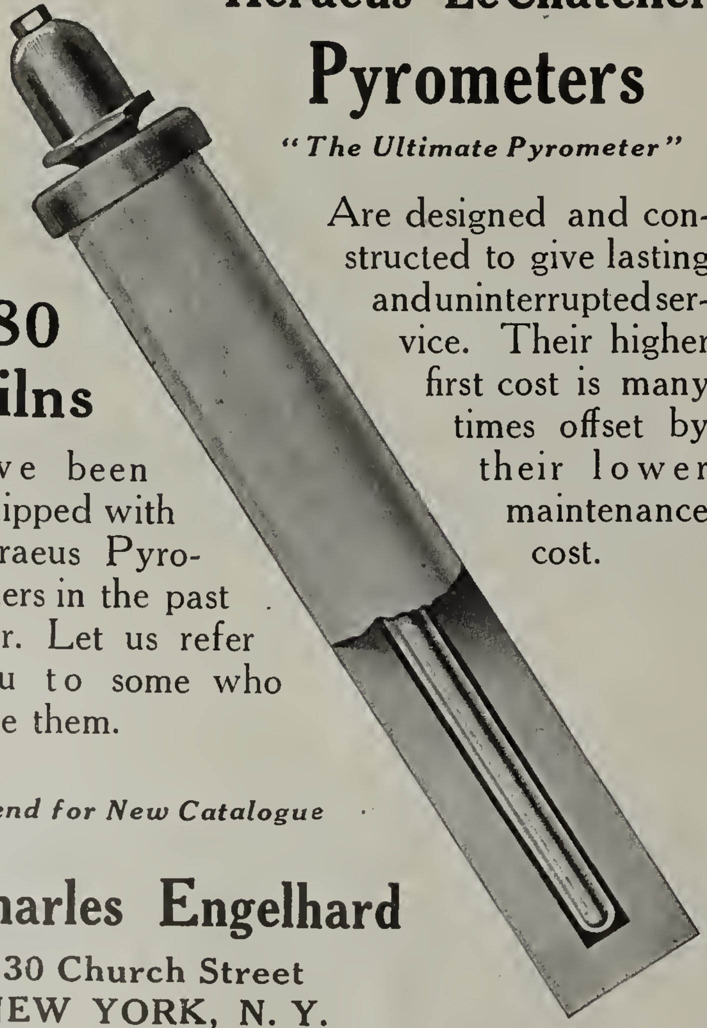
"The Ultimate Pyrometer"



Are designed and constructed to give lasting and uninterrupted service. Their higher first cost is many times offset by their lower maintenance cost.

180 Kilns have been equipped with Heraeus Pyrometers in the past year. Let us refer you to some who have them.

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Charles Engelhard
30 Church Street
NEW YORK, N. Y.

the experiment proving satisfactory in cost and enduring in quality, no doubt much of the public highway work in the country districts will be laid with brick.

According to a recent statement made by Walter W. Bradley, mining statistician of the California State Mining Bureau, who is compiling information on the final figures of mineral production for the year 1915, Los Angeles county leads the state in the manufacture of brick.

Gladding, McBean and Company besides furnishing face-brick for the new public library building in San Francisco, Cal., have contracts for the terra cotta on the Overland Garage, the Kerkoff Building, Los Angeles, the New Catholic Church at Bisbee, Ariz., the Portland Auditorium at Portland, Ore., and other jobs of less importance.

The last of the wooden "shacks" erected in the down-town section of San Francisco immediately after the big fire of 1906 have been ordered down, and these will now be replaced with fireproof buildings of Class A, B and C types. Forty old wooden buildings are included in the order, a total of about seven hundred having been removed in the last two years.

J. H. McKnight, 5707 Pasadena Avenue, Los Angeles, claims to have discovered chemical and physical bases with which he can successfully bond magnesite into brick. In his process he first calcines the magnesite, then grinds it and adds chemical and physical bases. He then presses the material into brick, which he dries and then refines. All the materials necessary are available in the vicinity of Los Angeles.

Mr. Gwynn, manager of the San Francisco office of N. Clark and Sons, says that the terra cotta business is picking up and that smooth brick and sewer-pipe show favorable activity. The Clark company has been awarded the contract for supplying a large quantity of architectural terra cotta for a new high school at Los Angeles. The company's polychome terra cotta, a highly ornamental product, is being used on the new court house of Lassen county. Sewer-pipe is being shipped on the company's contracts for work at Stockton, Cal.

At a meeting in San Francisco during the early part of the present month the Northern California Mantle and Tile Dealer's Association took up the matter of improving the tile situation. A resolution was passed urging the members to put in no lump sum bid to any contractor or architect while the job was being figured, in cases where more than one thousand feet of tiling were to be used. After the contract has been awarded, lump sum bids may then be given to the successful contractor. The officers elected by the association were: Charles Halloway, Jr., president; G. McElhinney, vice-president; F. T. Connor, secretary-treasurer; and Ed. Hulse, Thomas F. Rigney and Carl Ericksen, trustees.

The Steiger Terra Cotta and Pottery Company, San Francisco, reports a favorable reception for its new product—"Thru-an-Thru" terra cotta—a ware with coloring intermixed in the texture of the body and hence the same all thru. This material is suited for the highest class of work. Already numerous inquiries have come in from architects and builders. The Steiger company is supplying terra cotta for the new wings being added to the City and County Hospital; also terra cotta for the Hall of Justice at Sacramento; a new department store at Logan, Utah; the Lange and Bergstrom Apartments in San Francisco and several school jobs and business blocks thruout the state.

The California Paving Brick Company, Oakland, has supplied vitrified paving-brick for the United Railroads of San Francisco, this product having proved highly satisfactory for paving between street car tracks. The city of Oakland is also about to use a large quantity of "pavers" on several city streets as an experiment. F. A. Costello, president of the company, says that they can manufacture the highest grade paving-brick from their shale mined at the Calavaras county holdings, and put them upon the San Francisco market much cheaper than would be the case with paving-brick made in the Northwest. The company expects to operate on a much larger scale in the near future.

Colorado

The Boulder (Colo.) Pressed Brick Company has recently added three men to its force, making a total of twenty-one. F. M. Lesser, manager of the company, reports a fine business, with indications pointing to a record year.

Connecticut

Notwithstanding the fact that brick manufacturers in Connecticut generally have orders enough to keep their plants working on full time for the entire summer, many plants are now idle or running on part time and the output of brick is far below normal. Scarcity of labor is the chief trouble. The strike on the yards in the vicinity of Berlin, which was settled some time ago, drove many of the experienced workmen away from that section. At Kensington fully two hundred hands are said to have left town and secured employment elsewhere.

District of Columbia

The contract for the brickwork on the new central power plant at Washington, D. C., to take about 1,500,000 red brick, has been sub-let to B. F. Gormley of that city, who has not as yet placed the order for the brick. All of the local companies are bidding on this job. The new building will cost more than $1,000,000, for which money has already been appropriated by Congress.

The Southern Railway is tearing down an old stone building in Washington, D. C., which was partially destroyed by fire recently. The railroad company will erect a new building on the old site adjoining another structure which it has just about completed. The new building will conform in appearance to the recently erected structure, some 200,000 gray, rough-textured face-brick being used in the exterior walls of the latter. These were furnished by the Hydraulic-Press Brick Company of that city. An equal number of brick will be required for the new building, it is thought.

Illinois

The brick plants of Albion, Ill., are experiencing great difficulty in securing a sufficient number of cars. It is reported that, while twenty cars could be shipped each day, only six or eight are received, causing much inconvenience in making deliveries.

Fire recently swept the plant of the Acme Brick Yards at Chicago Heights, Ill., destroying the sheds and a large amount of wood that was to be used in burning, and causing a loss of about $6,000. The fire is supposed to have originated from one of the kilns.

The strike at the Albion (Ill.) clay plants has come to an end after three weeks of idleness on the part of the workers. A recognition of the union was granted in the

Hettrick Canvas Belting

has "pulled" so many brick plant superintendents out of the rut of despair that in many quarters it has come to be known as the belt with a "double pull."

It is truly a wonderfully pulling belt—it sticks and does not slip.

It is giving excellent service daily in transmission, elevating and conveying.

Try the Hettrick yourself and you'll soon be convinced that it **beats them all.**

HETTRICK BROS. CO.

Toledo **Ohio**

You won't have to worry about competition if you treat your clay with

R. H. Precipitated Carbonate of Barytes

You can safely guarantee that your brick will be

Scum-Proof

You can get a higher price and influence architects to specify your product because Efflorescence is prevented absolutely.

But insist on the R. H. BRAND—it's dependable.

We have a complete line of high grade chemicals for the clay industry.

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East Liverpool, O. Philadelphia, Pa. New Orleans, La.
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WHAT STEPS are YOU TAKING
to make the "WHEELER" available
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He is no longer needed for this simple job.
Elwell-Parker SELF-LOADING Electric Trucks
with one man, will successfully do the work of six men in most plants, handling clay products between presses, driers, kilns and yards or cars.
It will pay you to investigate—it has others.
THE ELWELL-PARKER ELECTRIC CO.
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"Nothing Succeeds Like Success"
THWING
HIGH RESISTANCE MULTIPLE RECORD
PYROMETERS
Have been placed in
EIGHT MORE
CERAMIC PLANTS
Since the Cleveland convention
Are you Interested?
Let Us Tell You About It
THWING INSTRUMENT COMPANY
437 N. FIFTH STREET
PHILADELPHIA, PA.

agreement by the companies, but the wage scale remained the same.

Chicago interests, backed up by the Whitehall (Ill.) Business Men's Association, have completed arrangements for the construction of a $250,000 brick plant at that point, so far as the sale of stock is concerned, pledges for $25,000 in stock having already been obtained by local men. The proposed site of the new industry is between the Chicago and Alton and the Chicago, Burlington and Quincy Railroad tracks.

Indiana

The Indiana Paving Brick Publicity Bureau, at a meeting held recently at Brazil, approved the plans and specifications for a proposed brick road which will extend two and one-half miles north of that city. The monolithic type of construction will be used in laying this pavement.

As an advertising feature for the city, the Municipal Electric Light plant at Anderson, Ind., is planning the construction of a new one hundred foot brick stack on which will be emblazoned the name of the municipality. The letters will be made by using a special facing brick of contrasting color, each letter being about seven feet in height. They will be arranged lengthwise on the stack.

Workmen have begun tearing down the Jay county court house at Portland, Ind., one of the old landmarks of the county. The building was built in 1869, the brick being furnished by the late David T. Taylor, who, at that time, owned a brick yard near College Corner, Ind. The brick are all hand-molded and are much smaller than those manufactured at the present time.

Brick made by J. M. Leach Company of Kokomo, Ind., were used for two purposes in the construction of the new W. H. Mohler bakery at Kokomo recently. In addition to the building being built of brick, the company's product was also used for the walls of two Buhrkop ovens installed in the plant. A high grade white enamel brick was used for the walls of the ovens, and Kokomo red brick were used in the building.

The Zuber Drain Tile Company of Columbia City, Ind., has re-opened its plant after a period of inactivity dating back to August, 1915. The plant had been closed because good clay was not obtainable. A new bed of clay has been discovered, however, near the Miller brick yard on the old Erdman farm, and the first kiln will be burned in a few weeks. Charles Vance is in charge of the workmen who are now preparing to resume activities.

Iowa

The name of the Platt Pressed and Fire Brick Company of Van Meter, Ia., has been changed to that of the Platt Company.

The Sioux City (Ia.) Brick and Tile Company recently burned the first kiln of face-brick to be used in the new Woodbury county courthouse to be built at that point in the near future.

The Vincent Clay Products Company, Fort Dodge, Ia., is taking advantage of the idleness caused by a strike of common laborers on its plant, to install additional equipment and make necessary repairs.

Kentucky

The Burley Association at Greenville, Ky., is promoting a brick manufacturing plant with a 5,000,000 capacity. It is stated that the plans for the new plant are developing nicely and that the hopes of the promoters will be realized.

During a heavy windstorm which struck the eastern part of Kentucky the first week in June, the top of a kiln at the Red Brick Company's plant, Ashland, was blown off and fell upon three of the workmen employed in the plant. Joe Christian was killed almost instantly and the others were badly injured, altho they are recovering.

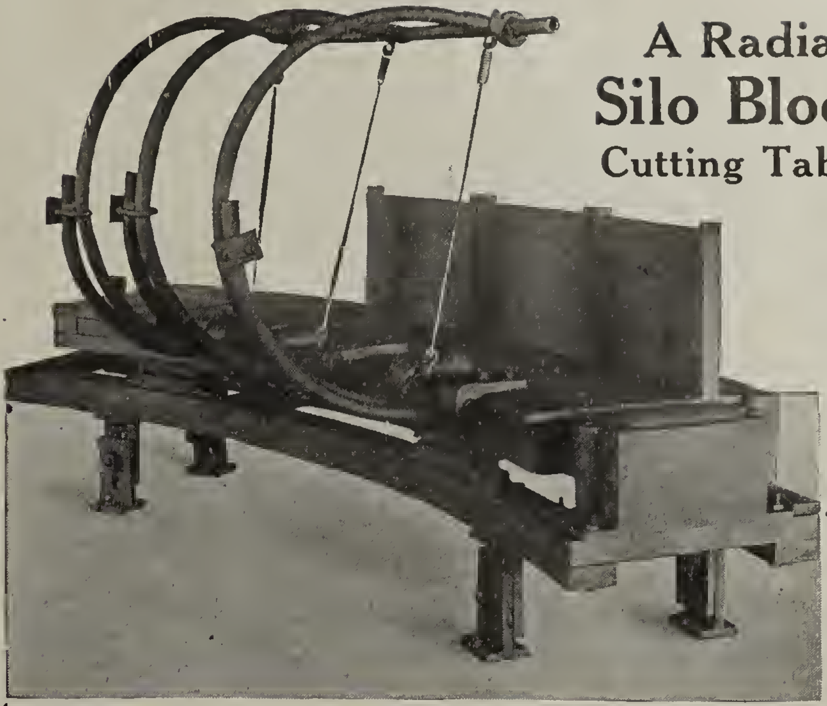
An instance of the way in which manufacturing establishments are coming to realize the desirability of providing buildings which will make a good impression on those who see them, is to be noted in the case of the Louisville (Ky.) Drier Machine Company on Baxter avenue, a company manufacturing a drying device for grain dealers. The whole front of this company's building is being remodeled, the plans calling for a facing of rough-textured brick laid in Flemish bond furnished by the Hydraulic-Press Brick Company. The order was secured by the Tyler Building Supply Company.

A. P. McDonald, sales manager of the P. Bannon Pipe Company, Louisville, Ky., has returned from a trip thru the state where he closed up some attractive business. Mr. McDonald said that the state was producing a large number of orders this year. The contract for the hollow-tile and the hollow-brick which will be used in the second group of the Speed Realty Company buildings has been awarded to the Bannon company and deliveries are to be started shortly. This is one of the good contracts of the season. All of the plants of the company are operating to capacity and some of them are working overtime.

In connection with a campaign which has been renewed in Louisville, Ky., to do away with the smoke evil, the brick manufacturers of that city were particularly complimented at a public mass meeting recently by speakers who included Oscar Monett of Chicago, Payne Rutherford, Smoke Inspector of Louisville, Frank N. Hartwell, president of the Local Smoke Abatement League, and others. If the brickmaking industry with its peculiar requirements has been able to eliminate the smoke nuisance, it was pointed out, other manufacturers with nothing like the same handicaps, ought to be able to make at least as satisfactory progress.

The Tyler Building Supply Company of Louisville, Ky., has been awarded the contract by the Speed Realty Company for the terra cotta to be used in the second group of buildings the estate is building in the heart of the city. This will in effect be a central wing of an extended structure reaching, when completed, from Fourth to Third streets, on Guthrie. The Atlantic Terra Cotta Company, which made the first lot of terra cotta, will also execute the order for the second contract. This involves approximately $16,000. In addition to the exterior facing the Speed company has decided to line the elevator lobby with terra cotta in the manner in which the rathskeller of the Seelbach Hotel is finished.

The Coral Ridge Clay Products Company, Louisville, Ky., is not pushing face-brick at this time, according to James T. Howington, general manager, who stated that the plant had all of the business in common-brick and hollow-tile that it could handle. Orders on hand call for 2,500,000 brick and 2,000 tons of tile as soon as they can be delivered. George H. Fiedler's active connection with the company terminated, as previously announced, on the first of June, and he has accordingly left to spend some time in Georgia. Later he will stop over in Louisville on his way to Chicago. The situation



A Radial
Silo Block
Cutting Table

The Farmers Will Build
Hollow Clay Tile Silos

Are you prepared to manufacture—silo block—cheaply?
Get in touch with us and find out about this modern cutter.
You can't afford to be without it.

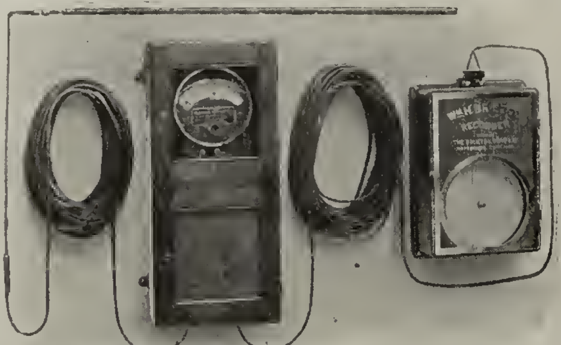
WRITE US TODAY—NOW
CRAWFORD & McCRIMMON CO.
Brazil, Indiana

HOOK'S
Latest Patented System
For Burning Your Clay Products
Means Success for You

Scores of Brick and Tile Manufacturers in the UNITED STATES and CANADA are burning their ware successfully with HOOK'S LATEST IMPROVED UP and DOWN DRAFT KILN.

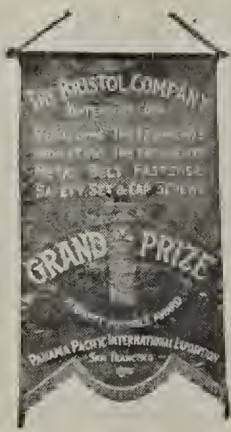
In one section of OHIO, where Hook's Latest Patented Kiln is best known, one of our Representatives took orders for over 20 kilns in 3 days. This ought to be convincing evidence. Do not be deceived—insist on having HOOK'S Latest Patented Kiln.

SOLD ONLY BY
Ohio Kiln Company
Vigo, Ohio



Bristol's Pyrometer Installation

For many practical applications of electric pyrometers it is desirable to have the furnace temperature indicated at the furnace operator's post of duty, and a recorder installed in the office of the superintendent. This combination indicating and recording unit of Bristol Pyrometers, as shown above provides for both these requirements. Highly recommended for brick kilns.



Write for Bulletin 205

THE BRISTOL CO.
WATERBURY, CONN.

BRANCH OFFICES
BOSTON NEW YORK CHICAGO
PITTSBURGH SAN FRANCISCO

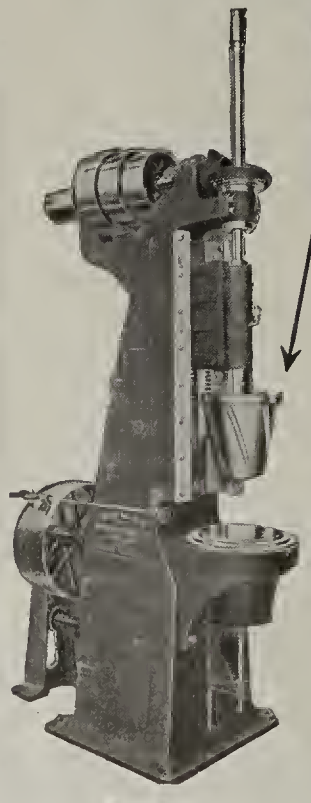
Why Don't You Make Flower Pots

It's a big field with very little competition, and it makes a profitable side line for any plant making brick or tile products.

Start right by adopting the

Baird

Flower Pot Machine



Simple in operation, accurate in its work, and from six to ten times as rapid as old methods.

Send us a sample of your clay—we'll show you what our machine will do for you, and send you full information.

Baird Machine & Mfg. Co.
54-56 Jefferson Ave.
Detroit, Mich.

with the Coral Ridge company as to the car shortage has shown marked improvement during the past few weeks.

Of particular interest to Kentucky brick manufacturers, as well as to employers in other industries, is the news that the new workmen's compensation law, enacted by the state legislature last winter, has been upheld by the Court of Appeals. It will, therefore, become effective on August 1 and the Compensation Board is now listing employers who will accept its provisions. All except one provision of the law, which relates to the indemnities to be paid to non-resident or alien beneficiaries of persons injured, have been passed on by the court and later rulings on this point will not affect the rest of the law. No state fund is created, but commercial and mutual companies will carry the insurance. The law is virtually compulsory since it deprives employers, who decline to accept its terms, of the usual common law defense.

The Louisville (Ky.) Builders' Supply Company, jobbers of brick and other building materials, has made two important changes in its selling force since A. E. Livingston became the active head of the concern. Houston Fairleigh, formerly a brick salesman with the Union Cement and Lime Company, and Sam Conner, formerly with the Monongahela River Coal and Coke combine, have joined the sales department. Mr. Livingston is injecting some "ginger" into the organization. He recently landed an order for 100,000 brick to be used in the R. E. Wathen distillery and has several small contracts on hand. The company has just purchased a new three-ton delivery truck. The building supply houses in general are using trucks at this time, the E. T. Slider Company of New Albany and Louisville having just acquired two five-ton trucks.

Maine

The Purinton Brothers Company of Augusta, Me., has completed the work of moving its brick yard on the Belfast road and the first kiln is now being burned. The firm has a large number of orders and expects to have a busy season, running the plant to capacity until cold weather.

Maryland

The work of constructing the Lonaconing (Md.) plant of the newly organized Maryland Clay Products Company is scheduled to start very shortly. Three miles of tramroad are to be laid to the openings of the clay deposit. Plans are also under consideration for developing the coal deposits on the company's tract. David Williamson and Elkins Read, operating officials of the company, are to be in charge of all the construction work. It is of interest to note that one of the first buildings to go up will be a shower bath and locker building for the workmen, making it possible for the men working in the mines or on the plant to come and go from work with clean bodies and clothing.

Massachusetts

The Worcester (Mass.) Sand Lime Brick Company, a concern incorporated in 1912, with a capital stock of $150,000, has filed a petition for a decree of dissolution.

Michigan

Orders for one million brick were filled during the month of May by the Michigan Face Brick Company of Grand Rapids, Mich.

The Grande Brick Company of Grand Rapids, Mich., is doing a big business at the present time. Contracts for buildings are now being carried out in Big Rapids, Muskegon, Fowler and Hastings, creating a good demand for brick and other clay products.

According to Manager Brooks of the Wolverine Brick Company, Kerby, Mich., the manufacture of silo tile will be started in the near future. It is anticipated that the company will do enough business in that product to operate thruout the entire year.

The Saginaw (Mich.) Paving Brick Company, according to its president, John H. Qualman, has begun operations for the season after a delay of six weeks that was occasioned by high water this spring. The plant, which is one of the largest in the state, has been in operation for twenty years at that point and has a capacity of 1,000,000 face-brick per month.

The George H. Clippert Brick Company and the William Clippert Brick Company, both of Detroit, Mich., have taken out memberships in the local Animal Welfare Association. Affiliation with this organization involves the signing of a pledge whereby the member guarantees humane treatment for his horses at the hands of his teamsters.

The opening of the new quarters of the Builders and Traders Exchange, occupying an entire floor of the Penobscot building, Detroit, Mich., took place Thursday, June 1, there being flowers for the visitors and music by a large orchestra. Among those having offices and exhibits on this floor are the George H. Clippert Brick Company, the Detroit Brick Manufacturers' and Dealers' Association, and the local tile association.

Missouri

The Hydraulic-Press Brick Company of St. Louis, Mo., thru its salesmanager, F. C. Aschemeyer, has received the contract for brick to be used in paving that will be undertaken shortly by Jefferson City, Mo.

Montana

As a part of a plan of the employers in Butte, Mont., to break the power of the labor unions, the brick and tilemakers of that city have discharged all their men and have closed their plants indefinitely. The bankers, merchants and employers of labor in Butte are organized and claim to be able to meet all eventualities.

Nebraska

The city council of North Platte, Neb., has decided that the twenty-five blocks of paving to be laid in that city this summer will all be of brick.

New Jersey

The new plant of the Sneyd Enamel Brick Company recently constructed at Trenton, N. J., was placed in operation the early part of this month. Charles Phillips is general manager of the company and S. Wright holds the position of chief engineer.

The Stone and Art Tile Company of New Jersey has been incorporated to manufacture tile. The principal office of the new concern which has a capital stock of $50,000 is in Jersey City. The incorporators are Walter J. Gorman, Lillian Gorman, William Ritchie and Martin V. Ryerson, all of Jersey City.

Since E. R. Proctor has become superintendent of the Perth Amboy (N. J.) plant of the Atlantic Terra Cotta Company, several changes have been made. A new department, known as the molding department, has been formed with R. W. Bauhahn as foreman. This department was formerly part of the model work of this plant

TAKING this hard blue shale out of a 60-foot bank is *some task* when it comes to a steady job—but so far this little Model 28 "Marion," owned by the Akron Brick and Tile Co., at Akron, Ohio, hasn't slipped up noticeably. What it *has* done is to

Increase the Plant Capacity, Producing a More Uniform Brick

—two things that you and every owner are looking for with both eyes.

There's no question that Marion Shovels *are* doing big things for brickmakers all over the country. That's because they're built for the job, carefully planned in advance by people who know what clay-digging requires.

Special Brick-Makers' Catalog A120 makes good reading; glad to send it, without obligation, on request.

Marion

We Make Excavating Machinery of Every Description

Branches:
Atlanta, Chicago, New York, San Francisco, Seattle

THE MARION STEAM SHOVEL COMPANY
Established 1884
MARION, OHIO
121

Your Ware Is As Good As You Make It!

To make a merchantable class of ware it devolves upon you to perfect each single phase of the manufacture—from the selection of the clays to the sorting of the finished product.

The correct measuring and mixing of two or more raw clays is of tremendous importance.

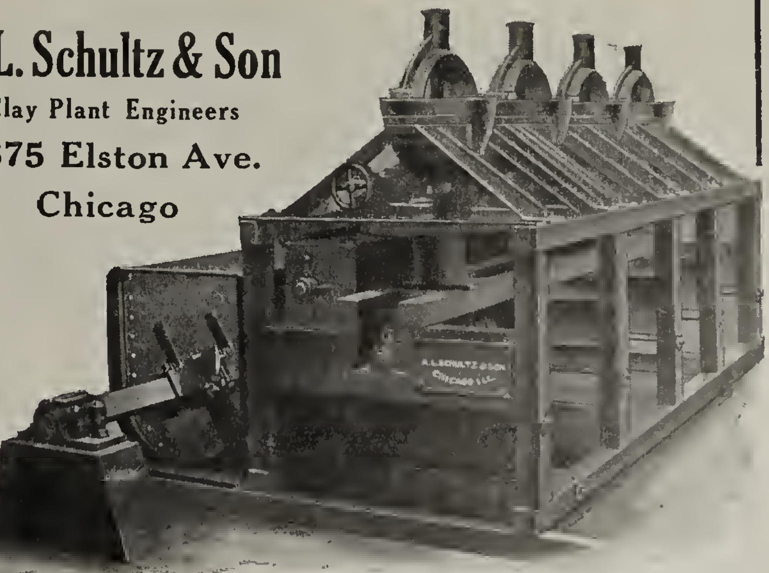
Financial success or financial failure depends upon the ability of your men or machines to standardize the batch.

To depend on your men to measure, to guess, to mix with shovel—or slide gate and chute is to have the batch run wild.

A dependable machine is your only alternative, and that machine is the Schultz proportioner—it measures, mixes and tempers. Set it and leave it. It does its work well.

Get details from

A. L. Schultz & Son
Clay Plant Engineers
1675 Elston Ave.
Chicago

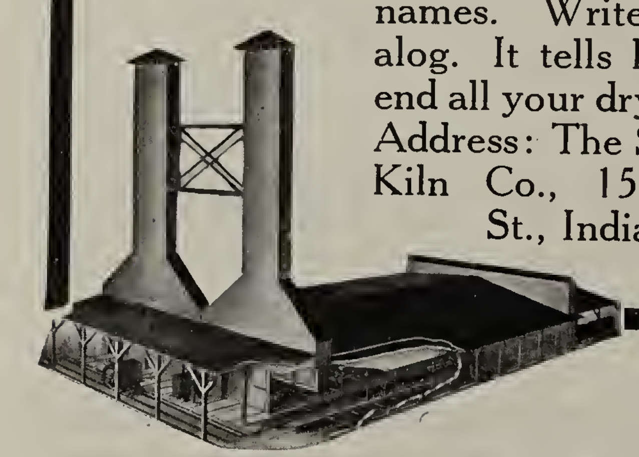


Does Your Product Check and Crack in the Drier?

It should not. With correctly designed drying apparatus it would not. These are unnecessary evils, due to wrong drying methods. A great many brick manufacturers have found out by experience that

The Standard Drying System

prevents checking, cracking and kindred evils. We would like to send you their names. Write for our catalog. It tells how you can end all your drying troubles. Address: The Standard Dry Kiln Co., 1540 McCarty St., Indianapolis, Ind.



There is a man—

a manufacturer of fireclay products; he has used Canton Kiln Grates for four years.

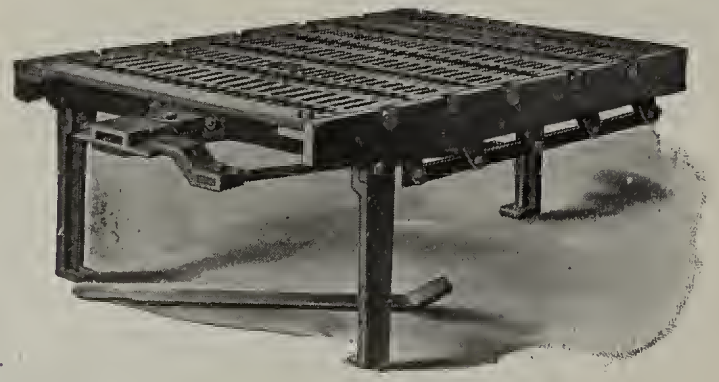
This man saved 30% of his burning costs each year in the first three years.

Today, in the fourth year, he claims and is accomplishing a saving of—40%.

Are you neglecting an opportunity? In all fairness to yourself, to your trust, to your company—is it right for you to any longer neglect an investigation of Canton Kiln Grates?

We have dozens of sets in kilns. We will furnish you a set on a trial basis.

Write that letter to us—now.



The Canton Grate Co.

1706 Woodland Ave.

CANTON OHIO

with Mr. Jaycox at its head. The company has also secured a new chemist, J. B. Howat, who was formerly with the United States Bureau of Standards at Pittsburgh, Pa.

New York

Labor troubles have just developed on three yards at Roseton, N. Y. The Roseton Brick Company, the Jova Company and the Armstrong Company are tied up with a strike in which over seven hundred workmen are participating.

The United Shale Products Company was recently incorporated at Buffalo, N. Y., with a capital stock of $30,000, for the purpose of dealing in brick, tile and other building materials. The incorporators are J. Schmidt and J. and G. Jepson, all of Buffalo.

North Carolina

Johnson and Johnson Company, one of the largest brick manufacturing concerns in North Carolina, and operating an enormous plant at Raleigh, has leased an office in the Commercial Bank Building of Charlotte and will send a representative there to develop the new territory. The Norfolk-Southern Railroad has opened a direct route from the company's plant to Charlotte, making the last mentioned point a good distributing center.

North Dakota

Operations have been started at the plant of the Red River Valley Brick Company of Grand Forks, N. D., two of the three brick machines being operated.

Ohio

The capital stock of the Warren B. Ferris Brick Company of Columbus, Ohio, has been reduced from $100,000 to $50,000.

The Dover Fire Brick Company of Cleveland, Ohio, is now operating its new plant at Strasburg, Ohio. H. E. Stuhler is secretary and treasurer of the company.

The J. A. Miller Tile Company has been incorporated at Bascom, Ohio, with a capital stock of $15,000 by James A. Miller, William H. Miller, Clarence E. Park, John W. Graun and James H. Grear.

The Willis Brick Company of Cincinnati, Ohio, has been incorporated with a capital of $5,000 to deal in brick and terra cotta by Robert J. Willis, R. Weber, W. H. Willis, Herman A. Bayless and L. Walsh.

C. C. Walters of the Hocking Valley Products Company, Columbus, Ohio, reports an excellent business far ahead of last year. He says prices are also holding up well and that the prospects for the future are bright.

J. M. Adams, general manager of the Ironclay Brick Company, Columbus, Ohio, made a thoro inspection of the plant located at Shawnee about the middle of June. Mr. Adams reports a good demand for face-brick with prospects bright for future business.

The Mazurie Clay Products Company of Uhrichsville, Ohio, has been incorporated with a capital of $100,000 to manufacture brick and tile. The incorporators are James J. Mazurie, Ira E. Weel, Byron E. Ottman, William E. Elliott and Walter W. Weel.

The first continuous kiln to be installed in Columbus or vicinity is being built by the Hallwood-Conard Brick Company at its new plant near Indianola Park. The kiln is planned to be smokeless and was installed in accordance with the plans of the city smoke inspector.

The Ohio Public Utilities Commission has rejected the schedule of increased rates on shipments of drain-tile, filed some time ago by several of the railroads in the state. The action of the commission makes permanent the temporary suspension of the proposed new rates, ordered some time ago.

More favorable weather which came after the first week in June has stimulated construction work in central Ohio. The excessive rains ceased for a time at least permitting contractors to get started on jobs already under contract. This condition is expected to stimulate the demand for brick of all kinds.

The majority of Ohio face-brick manufacturers now have a good supply of cars for making shipments promptly. The situation in this respect is considerably improved over a month ago, when cars were very scarce. But the present condition is expected to be only temporary, a car shortage being anticipated for later in the season.

Following a fire in the barns of the Cleveland (Ohio) Builders' Supply Company, in which eight high-priced horses were burned to death, this firm has posted a reward of $1,000 for the arrest and conviction of incendiaries believed to have set fire to the building. The property loss was $8,000 in addition to the value of the horses.

The contract for the brickwork on the Seneca Hotel to be erected on East Broad street, Columbus, Ohio, has been awarded to Heiser Brothers of that city by the general contractor, Peacock and Son, Cincinnati. The Ironclay Brick Company furnished the paving-brick to be used in the foundation, while the Claycraft Brick Company secured the remainder of the contract.

The Medal Paving Brick Company of Cleveland, Ohio, held its second meeting recently at its Carrollton (Ohio) plant for the purpose of bringing the manufacturing and sales departments in closer touch with each other. Charles J. Deckman, vice-president of the company, says that the present plan is to hold these meetings every month. The next meeting will be at Cleveland.

The Pursell-Grand Company, Cincinnati, Ohio, has experienced the best season so far in its history, in spite of a considerable amount of rainy weather which has handicapped builders and material handlers in this vicinity. Among recent contracts landed by the company are the addition to the L. B. Harrison Hotel for which it will furnish 65,000 face-brick, the Masonic Temple at Ironton, Ohio, for which 40,000 face-brick will be required, and the Pleasant Ridge Bank.

According to President John M. Stoner of the Cincinnati (Ohio) Clay Products and Supply Company, the company's business is running considerably ahead of last year so far, in spite of the fact that deliveries are on orders for residences and other small structures. When it is considered that the company will soon begin delivery of the million brick which it will furnish for the Hyde Park high school, it can be seen that 1916 bids fair to be a banner year.

Owing to the shape of the city treasury in Columbus, paving contracts where brick is to be used are rather slow this season. At a recent election the voters failed to approve a number of large bond issues which would mean the paving of a number of the city's thorofares. As a result little work is being done in the Buckeye capital. On the other hand there is considerable work going on in the cities and towns in central Ohio, where municipal finances are in better shape.

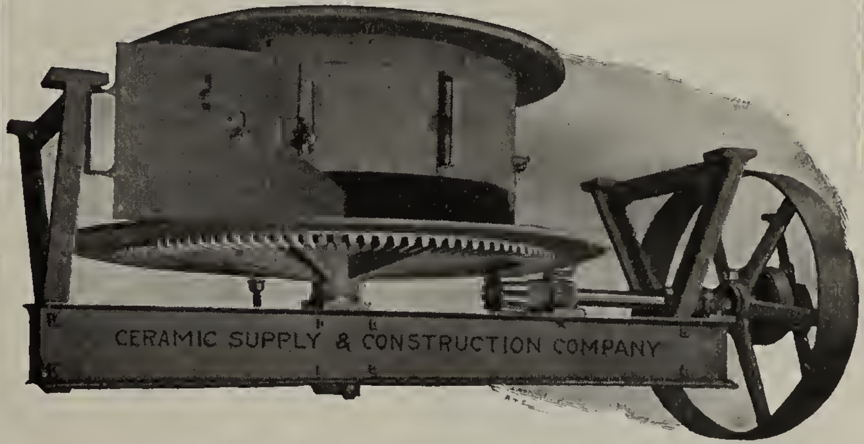
The first prize, model house of stucco and hollow-tile, shown at the Complete Building Show in February, was loaned by the Barkwell Brick Company to Borrows Brothers Company, stationers, recently to celebrate the opening of its new store. The model was a drawing card for the store and, in-

A New Sewer Pipe Truck

that is built in three different sizes:
No. 1. To handle 18"-20" and 24" pipe.
No. 2. To handle 27" and 30" pipe.
No. 3. To handle 33" and 36" pipe.

This Truck will be manufactured with the same care and skill shown in our Sewer Pipe Presses, Wheelbarrows, Dry Pans, etc. Send at once for descriptive matter.

The Toronto Foundry & Machine Co.
Toronto, Ohio



"Bolt It to the Bin"

The Columbus Feeder

for automatically feeding

Crushed Clay to Dry Pans *and* Pulverized Clay to Pug Mills

is fast coming into general use. There's a reason. Let us show you—furnish the machine on trial.

Send for Circular.

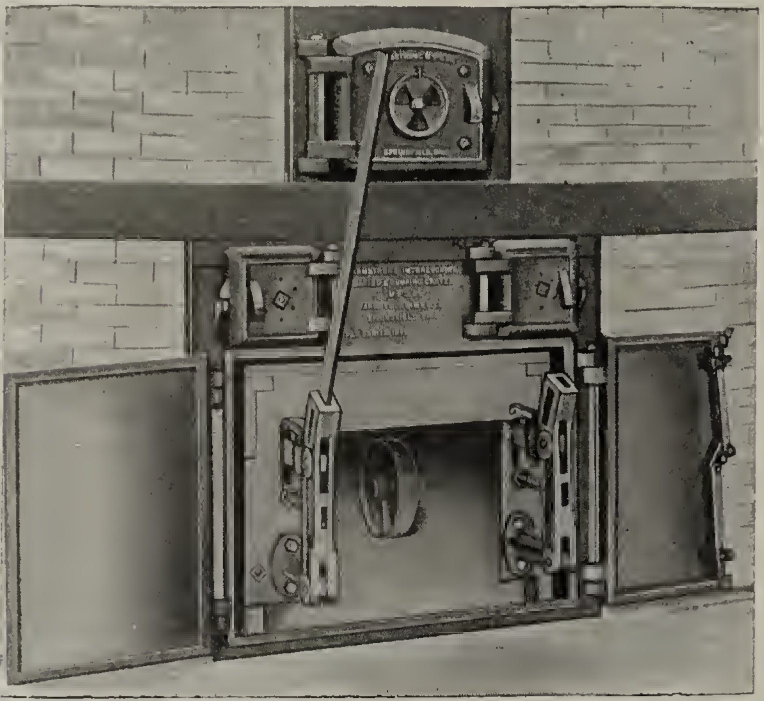
Ceramic Supply & Construction Co.
Columbus, Ohio

WILL YOU ACCEPT THIS OFFER?

We will ship you, no matter where your brick plant is located, our

STANDARD INTERLOCKING KILN GRATE

We will install it at **our expense**—let you give it a thoro trial—and if it does not do all we claim for it in **your** opinion, we will remove it without one cent of cost to **you.** **We know** what our grate will do—all we ask is a chance to show **you.** Write for details and prices.



The Armstrong Manufacturing Co., Springfield, Ohio

POSTERETTES

200,000 of the "Build with Brick" posterettes have been used by brickmakers throughout the country. As many pieces of mail and express matter have carried the "Build with Brick" slogan to a vast army of prospective homebuilders.

Here is the second edition—the stamp advertising paving-brick. It tells a story that carries a moral—and that moral means better business for the men who make paving-brick.

How about using some of them—now?

Printed in THREE colors

Gummed and ready to stick on your letters, envelopes and packages.

$1.50 per thousand postpaid

Send your orders to

BRICK AND CLAY RECORD
445 PLYMOUTH COURT CHICAGO

cidently, a good advertisement for the Barkwell company. E. J. McGettigan, general manager of that concern, who saw to the placing of the model, is treasurer of the Hollow Building Tile Manufacturers' Association of America.

The Ohio Highway Commission on June 15 opened bids for the paving of a number of highways in various counties in the state. Several of the contracts call for brick, among which are the Cleveland-Meadville road in Geauga county, the Pomeroy-Marietta road in Meigs county, the Dayton-Indianapolis road in Montgomery county, the Dayton-Greenville road in Montgomery county, The Dayton-Covington road in Montgomery county and the Kenton-Upper Sandusky road in Wyandot county.

George Rinkenberger of the Brick Sales Company, Cincinnati, Ohio, reports a fair volume of business in all departments during the past few weeks, altho not up to the high standard set during the early part of the season before the slight slump caused by adverse weather conditions. Arthur W. Riggs who joined the company recently is now devoting most of his time to the brick end of the business while Mr. Rinkenberger is specializing on "Vitrolite," which is one of the most active lines handled by the company.

The Cleveland (Ohio) Shippers' Association representing brick and other clay products manufactures, sand and gravel producers in Cuyahoga county has filed with the Ohio Utilities Commission a complaint asking that seven railroads be compelled to reduce their switching charges in Cleveland. The association asserts that the Baltimore and Ohio, Erie, New York Central Lines, Pennsylvania, Wheeling and Lake Erie and the Newburg & South Shore Railroads have a mutual understanding whereby all of the roads charge the same switching rates, which are excessive.

The Shorey-Willis Brick and Supply Company, Cincinnati, Ohio, has been devoting a good deal of attention this spring to business on the Kentucky side of the river and, up to the first part of the current month, experienced an active demand from the cities to the south. The let-up noted in building circles has been in effect there as well as in Cincinnati, however, reducing business to a more limited volume. The common-brick plant whose output is handled by the company has been operated to normal capacity so far this season, except during a period of rainy weather which interferred materially with the output.

The city authorities of Dayton (Ohio) are reported to be seriously considering the experiment of having the city handle its own paving and it has virtually been determined that at least one brick paving job—that on Lakeview avenue—will be handled directly by Service Director Barlow and his force. This decision was arrived at recently when seven separate jobs were advertised and only one bid was received which was within the estimates made by the city's engineering department. If the experiment on the Lakeview avenue job proves successful, it is probable that other work will be handled by the city as well, especially as it would take a large amount of time to review estimates in order to make the work attractive to outside contractors.

The board of control of Marion, Ohio, has awarded the contract for paving Davids street, exclusive of that portion to be paved by the Columbus, Delaware and Marion Railway Company, to Brady and Drake for $49,648.93. The contract provides that Metropolitan paving-brick are to be used. The same contractors were given the work of paving the portion allotted the Columbus, Delaware and Marion Railway Company, at $12,847.60 for wire-cut or repressed brick. Two petitions are in for the paving of Carhart street, one asking for Roseville brick and the other for asphalt block.

Brady and Brake were also given the contract to pave Avondale avenue with Lincoln brick at $12,179.43.

It is reported by the commissioners of Stark county at Canton, Ohio, that thru the work of the Pittsburg Laboratories Company, which was employed to test all brick used in paving county roads, more than 100,000 brick have been rejected. The company has installed equipment for making the rattler test, and under somewhat severe requirements, strictly enforced, the inspectors employed by the company have thrown out a large proportion of the brick submitted. The system seems satisfactory, however, as tests of samples are made before shipment, and where they are not satisfactory the trouble and expense involved in the rejection of a whole shipment are avoided by the manufacturers and the county alike.

One of the largest orders for common-brick yet placed in the Cleveland (Ohio) district is that for 8,000,000 secured by the Farr Brick Company of which Robert C. Mitchell is general manager. This material will be used in the construction of the new plant of the American Steel and Wire Company at Newburg, and the plant of the National Tube Company at Lorain, Ohio. According to Mr. Mitchell, the price of common-brick has probably reached its apex now. In Cleveland $9 is the existing price, which is an increase of fifty cents over that of a month ago. On January 1, $7.50 was being received. The principal obstacle to capacity operations which the brick manufacturers of nothern Ohio have now to contend with is a scarcity of labor.

Oregon

Edward Sandeberg of Portland, Ore., has been awarded the contract to build the Myrtle Point main trunk sewer. The contract price was $14,567 for 25,000 feet.

It is reported that R. Dinninger is planning to construct a plant for manufacturing burned clay products at Paisley, Ore., and is at present making preparations for the purchase of the necessary equipment.

Pennsylvania

An order for more than 800,000 common-brick was recently received by E. C. Flurie, a veteran brickmaker of New Cumberland, Pa.

The Perkiomen Brick Company of Berks county, Pa., have been authorized to decrease its capital stock from $100,000 to $5,000.

Samuel G. Landis, a brick manufacturer of New Berlinville, Pa., reports a busy season. His plant is now turning out about 20,000 brick daily.

A. R. Miller of Delphi, Montgomery county, Pa., has closed his brick plant and will either sell or dismantle it. His father, who operated the yard for many years, has moved to Spring City, Pa.

The Boyer brick yard at Kutztown, Pa., is being kept exceptionally busy and is operating on a better schedule than for some years past. The company has at present a large number of orders on hand to be filled.

The Cambria county (Pa.) commissioners have decided to proceed with the immediate construction of two miles of brick paving on the highways between Ebensburg, the county seat, and Cresson. This work is estimated to cost in the neighborhood of $25,000.

The City of Reading, Pa., has awarded to Fehr and O'Rourke of that city, contracts aggregating in value $30,377.77 for the paving of various streets. One million paving-brick will be required for work included in this contract, which is to be completed by fall.

Who Pays?

for the wasted power to drive the line shaft when several of your machines are idle?—YOU—but you can stop this waste with—

Westinghouse Motor Driving a Dry Pan

Westinghouse Individual Motor Drive

Individual motors make each machine an independent unit. You do not have to furnish energy to drive fifty feet, or more, of shafting to operate a single machine.

A card will bring full information.

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Westinghouse Electric & Mfg. Co.
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Sales Offices in all Large American Cities

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SAY "I SAW IT IN BRICK AND CLAY RECORD"

SAVE! SAVE!

SAVE!

Everybody's talking about it—everybody's anxious to know **how**—a very small percentage have really taken steps to **save,** and **they** are the ones who have quit worrying about competition. **Their** manufacturing costs are so much lower, that many of them are doubling their former profits.

What are **you** doing to cut **your** costs? How much does it cost **you** to burn a thousand brick by your present method?

Do You Know that the

Hook System of Kiln Burning

is saving scores of brick makers large sums of money every year because it cuts down **fuel, time** and **labor costs?**

The Hook System will pay for itself in a short time because of the amount it will save you.

The Hook System can be applied to your present kilns at very low expense.

Ask us more about our system and let us send you the names of companies using it.

Get our quotations on kiln bands and grate bars.

HOOK PATENT KILN CO.
VIGO, OHIO
Canadian Office:
250 Dufferin Street, Toronto, Ontario

Brick plants in the vicinity of Pittsburgh, Pa., are reported as enjoying an exceptionally good season, especially in the paving-brick branch of the industry. If road jobs now under consideration by both county and state officials materialize, a much larger amount of brick paving will be laid this year than in 1915.

The big plant of the Wilkes-Barre and Hazelton (Pa.) Brick Company, recently built at Hazelton, is now in operation and is doing a large volume of business. While the full daily capacity of 80,000 brick has not as yet been realized, the officers expect the plant to be running to capacity within a short time.

The Montello Brick Company's plant at Wyomissing, Pa., has been taken over by the Wyomissing Brick Company and, after a period of idleness extending over eight years, is to be put in operation during the present month. The engines have been given preliminary tryouts after extensive repairs were made upon them, being necessitated by the long period of inactivity. It is reported that the plant will, in the near future, pass under the control of the Glen-Gery Shale Brick Company which at the present time operates a large plant at Shoemakersville, Pa.

Rhode Island

Rapid progress is being made in the erection of the new buildings at the Barrington (R. I.) Steam Brick Company's plant to replace those destroyed by fire last March.

The work of making brick at the plant of the Ashaway (R. I.) Clay Works is being pushed as rapidly as possible by the new owners who recently took over the property. New men are being taken on as rapidly as they can be secured. Several chambers of the continuous kiln are already filled with brick for the first burning. The product now being made is a finer grade than any heretofore turned out at this plant. As the excavation in the old pit goes deeper the clay deposit is said to improve in quality.

South Carolina

An order involving $10,000 and calling for tile for sidewalk paving to be laid in Asheville, S. C., was received recently by the Greenville (S. C.) Tile Company. Much of this work is being done by the Greenville concern which has, since its foundation, met with considerable success.

Texas

The Texas Clay Products Company is the name of a new company incorporated at Malakoff, Henderson county, Texas, with a capital stock of $75,000. The incorporators are Henry J. Scott, D. T. Bonar and E. H. Holcomb.

Vermont

The Drury Brick and Tile Company of Essex Junction, Vt., recently received a rush order by wire for 200,000 brick and, having already put into practice the national theme of preparedness, succeeded in getting over half the order on its way two days following. The remainder would have been shipped the next day had the company not been afraid of overtaxing the facilities of the receiving contractor.

Washington

With the object of bettering service, cutting costs, centralizing delivery and for the convenience of buyers, a number of brick manufacturers have organized the Brick and Tile Delivery Company with offices at the Hoge Building, Seattle, Wash., under the management of

E. A. Strout and Company. The Brick and Tile Delivery Company will attend to the delivery and act as the selling agent for the following five concerns: Builders' Brick Company, Harper-Hill Brick Company, Lohse Brick Company, Seattle Brick and Tile Company and the Washington Brick and Tile Company.

Wisconsin

The Burlington (Wis.) Brick and Tile Company has started working its clay pits. Present indications point to a very active year in the drain-tile field, assuring a busy season for this company.

The Ricketson and Schwartz Company of Milwaukee, Wis., recently received an order for 200,000 face-brick to be used in the construction of a new high school building being erected at Antigo, Wis.

The project of establishing a tile plant at Menomonie, Wis., is progressing rapidly, having the support of the local commercial club, which has appointed a committee to assist in developing the new undertaking. G. A. Perry of Stillwater, Minn., who is pushing the project, reports that tests made upon tile burned from Menomonie clays have resulted very satisfactorily.

The Granite Brick Company has been incorporated at Hollandale, Wis., by W. A. Kelly, H. L. Philips, W. W. Congdon, F. W. Hall and the Minnesota Dairy Land Association, all of Madison, E. Bright of Brodhead, and George W. Limbert of Hollandale. If present plans materialize the plant will be in operation by the early part of June.

Wyoming

According to H. G. Peters, proprietor of the Douglas (Wyo.) Brick Company, that concern is enoying a very good business. Orders are so far in advance of production that, unless a recession in the demand occurs, additional equipment will have to be installed.

POTTERY NOTES

A Resume of the Activities of the Potters and Some Mention of Their Plans for the Future

As a result of the burial by kilndrawers of the East Liverpool (Ohio) district of their own individual differences and agreeing to abide by their agreements made with the United States Potters' Association, work has been resumed in every plant in that territory. The action of the kilndrawers in striking and, at the same time, violating agreements which the Brotherhood of Operative Potters had made in their behalf, had the result of holding back production which has been retarded more or less during the past six months. Early in January production was curtailed on account of a shortage of gas. Upon several occasions similar delays have occurred. Here and there, unorganized workers have left their places, in both the East Liverpool and Sebring (Ohio) districts, so that still more delay was occasioned in maintaining normal capacity. However, just at this time, all plants are working on a normal basis, but the manufacturers will not be able to catch up with lost production no matter how hard the shops are pushed.

Thru the incorporation of the Carr China Company at Charleston, W. Va., a few days ago with a capital stock of $200,000, one of the few idle potteries in the country will be

GANDY

Try GANDY for that Hard Belt Service

WHERE everything is against the belt—where it is subjected to dampness, oils, greases, dust or dirt—try Gandy.

Because Gandy for 37 years has demonstrated that it can stand up against such conditions. Proof is all around you.

Gandy runs straight and true, and has a tenacious cling on the pulleys that reduces belt slippage and power waste.

Make the next belt a Gandy Belt. Be sure you get The Gandy Belt, with the Gandy trade mark stamped throughout the length of the roll.

Our stock comprises all widths and all plies from as narrow and as light as 1″ 4-ply to as wide and as heavy as 30″ 10-ply. This means your orders can be filled promptly with well seasoned stock.

Leading supply houses everywhere carry Gandy. Or write direct to us for a sample and prices. There is no obligation.

The Gandy Belting Company
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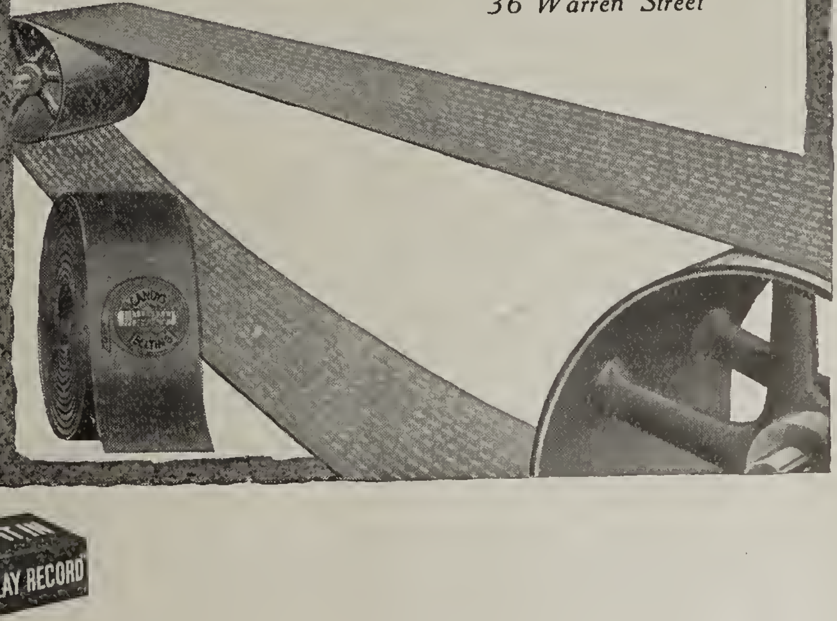

The Wise Man of FATE

Kaufman Says:

"Plymouth Locomotive Cheaper than Horses Hauling Clay"

M. J. Kaufman, purchasing agent for the Claycraft Brick Co., of Columbus and Groveport, Ohio, who bought a Plymouth Gasoline Industrial Locomotive, discarding horses, declaring that it was cheaper to do that than to buy horses, and subsequent events have proven that his Plymouth is cheaper to operate and maintain.

This picture shows The Plymouth delivering a loaded train of cars to the mill from the shale bank, Claycraft Brick Co.

'I Save 20c per Thousand Brick"
Says Mr. Kaufman

"We had three horses that costs us $225 each," writes Mr. Kaufman. "This, with the harness and equipment necessary, made The Plymouth cheaper in first-cost. It cost us 75c a day for feed, making a total of $2.25 per day. We employed three boys at $1 each, or $3 per day. This makes $5.25 per day for actual operation cost on the horses.

"We employ one man at $1.50 per day on The Plymouth. We used about seven gallons gasoline (67c) and quarter gallon lubricant (5c) making a total of $2.22 per day to operate The Plymouth against $5.25 for the horses, and we get much more work out of The Plymouth.

"We gain also in mining for The Plymouth is hauling clay at 40c per thousand brick while the horses cost us 60c, a saving that more than paid for our Plymouth in a few months time."

The Plymouth
Gasoline Industrial Locomotive
Does These Things

It costs less to buy and install than any other system—whether horses, steam, electric, compressed air or other gasoline motor.
It costs less for fuel than any other system.
It costs less for operation than any other system.
It costs less for maintenance than any other system.
It has greater draw-bar pull than any other system.
It has greater traction power than any other system.

The Plymouth Will Do These Things For YOU

If The Plymouth will haul brick 20 cents per thousand cheaper for The Claycraft Brick Co., isn't it reasonable to suppose that it will haul your clay and your brick cheaper for you? It is worth while investigating, at least, is it not?

THIS BOOK TELLS

We have a big book of real facts and figures—just off the press. It is entitled, "Cutting Haulage Costs in Two." It is full of cost data on this subject, collected from scores of clay plants, with much other valuable information, as well as numerous illustrations. Every clayworker ought to have a copy. You may have YOURS for the asking. Use coupon at left.

The J. D. Fate Co.,
240 Riggs Ave., Plymouth, Ohio.

Send us The Plymouth Book of Facts, this request not to obligate us.

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PLYMOUTH, OHIO

placed in operation within a very short time. This new concern, which will be headed by Thomas Carr, formerly with the Warwick China Company of Wheeling, W. Va., and more recently general manager of the Smith-Phillips China Company at East Liverpool, Ohio, will take over and operate the pottery at Grafton, W. Va., which was operated under the name of the Consolidated Manufacturers Company. This pottery has been considered by manufacturers to be the "last word" in construction, and is the most modern in the trade. Mr. Carr is one of the oldest operators in the pottery business and is a close student of ceramics, with particular reference to bodies and glazes.

The Hall China Company of East Liverpool, Ohio, has started the manufacturing of a line of chemical pottery, a fireproof vitreous body being used. Tests have proved the line to be superior in quality to many of the imported wares. This new industry sprung up as a result of the lack of imported lines. It is also pointed out that the buyers of this new ware will continue to order from American manufacturers after the European war ceases, as the chemical houses will not have to wait a long time for their orders to be filled, and reasonably prompt deliveries can be anticipated.

The use of Florida clays in the production of domestic pottery is more pronounced now than ever before. Manufacturers have, for the present, ample supplies of imported clays in stock, but they hold that it is impossible to predict what the future will hold with reference to additional imports of English china and ball clays. On this account, tests of Florida clays have been made both in American potteries and by the United States Bureau of Standards at Pittsburgh, Pa. These clays are declared to be equal to the stocks imported.

The Knowles, Taylor and Knowles Pottery Company of East Liverpool, Ohio, is having plans and specifications prepared for a new office and sample room to cost approximately $20,000. The concern is also planning other important additions to its plant and equipment. The plans for the office building call for a two-story structure with a large basement to be erected at Walnut street and Potters' Alley, in that city.

According to reports from Trenton, N. J., there is great prosperity in the porcelain trade at the present time. Manufacturers located in Trenton and Mercer county engaged in the making of porcelain goods, report that the trade is making rapid advances in the markets of the world. Much of the New Jersey porcelain is finding ready markets in foreign countries.

Several manufacturers in the East Liverpool (Ohio) district are preparing for 1917 by having orders placed for new dinner shapes. Last fall only a very few new shapes were placed on the market, but indications are now that at least six new shapes will be brought out for the new year's business. Modelers are now at work on many of these.

No German decalcomania has been received in this country for over sixty days, according to pottery supply salesmen and, as a result, all American "decal" factories are working to the limit of capacity. Shipments of English "decal" are being received in this country, but in limited volume.

A new glost and a new bisque kiln have just been built at the plant of the Albright China Company, Carrollton, Ohio. Additional decorating kiln capacity has also been provided. A steady increase in business since the firm's reorganization necessitated the additional kiln space.

Clay plants in the Toronto (Ohio) district are idle on account of a laborers' strike and not a wheel is being turned in any of the thirteen factories in that territory.

MACHINERY *and* EQUIPMENT

Descriptions of Machinery and Accessories and Detailed Announcements that Our Advertisers Believe will Interest Our Readers

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A Genuinely Rare Opportunity

It is very seldom that an opportunity comes to one, such as is offered in the proposed development of a large tract of valuable clay deposits lying midway between Baltimore and Washington. Those who have had the privilege of studying the reports made by most competent authority, have become greatly enthused over the possibilities presented.

There is not only a wide variety of good clays, but some of them show evidence of unusual quality. There is, for instance, a considerable quantity of Venetian Red Ochre, besides splendid clays that will make high-grade face-brick, terra cotta, tile roofing, pottery, etc.

The overburden is a fine grade of sand and gravel which can be easily removed, and for which a profitable demand exists in nearby cities. Its marketing will be greatly facilitated because of a spur track runing into the property from the main trunk line railroad adjoining.

This is not a "promotion" scheme, but a truly solid and substantial proposition, backed by people of financial responsibility and high character. They are desirous of communicating with parties having experience in the production of clay products and with sufficient capital for the establishment of a plant on the property. They will, if desired, become financially interested in the organization. Address Wm. H. Thomas, Jr., Station D., Baltimore, Md.

Reducing Brick Paving Costs

Every paving brick manufacturer is interested in the idea of reducing the cost of laying brick paving, because it makes it that much easier to compete with other paving materials. In fact, every brick man should be interested in this, because the more paving brick are used the more the public's attention is brought to brick for building.

Hence it is easy to understand the unusual interest

Paving Scene at Cleveland, Ohio, Showing How Roehl Bros. Utilized the Mathews Gravity Conveyer

This Cutter for Hollow Ware Delivers Block On End Automatically

The New Fate "Type D" Cutter, with Automatic Delivery for hollowware, automatically cuts all hollow block up to 14x14 inches, delivers them on end, reduces labor cost, cuts down waste and makes a poor clay or a good clay a profitable clay.

The Fate Type D Cutter

Revolutionizes Block Making

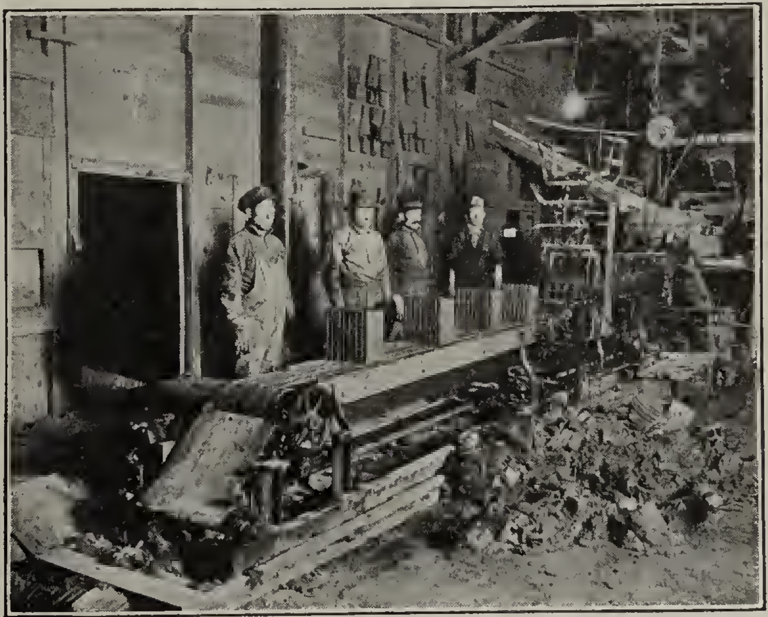
It delivers the block on end so that it may be safely and quickly handled on an off-bearing belt, which may be speeded up or slowed up at will with The Fate Friction Drive.

It eliminates the man who, usually, has to stand at the end of the cutter and acts as an off-bearer.

The Troy Fireproofing Company Gives New Device Hard Test

One of the "Type D" machines has been in use in the plant of The Troy Fireproofing Co., Troy, N. Y. The clay here is of such a soft nature that, prior to the installation, it was difficult to produce ware with economy because of the waste at the delivery end of the cutter.

The "Type D" Cutter cut this waste down to a minimum and the Troy plant now is enabled to produce a perfect hollow block at good profit.



Note the waste shown in the foreground above. This is a pile that was made before the "Type D" Cutter was put into operation.

GET THE FACTS

We have a big book of facts. It contains information about the entire Fate line of clayworking machinery, and every clayworker ought to have a copy. Your copy will be sent you for the asking. Use the coupon at the right.

The J. D. Fate Co.
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We are interested in the following machines or devices and ask that you send us special printed literature on the same, without obligation to us:

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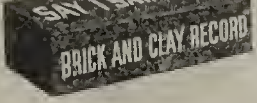

Your Last Chance

To Get These Reprints

All but the small number indicated have been sold and the plates destroyed.

No More Will Be Printed

so get your order in now for those you want.

These reprints of timely articles published in former issues of "Brick and Clay Record" make excellent educational and advertising literature

They Will Sell Your Product

Paving Brickmakers—You can use the first five—they have won contracts for others—they will do the same for you! Here is a list of those on hand and the quantity available:

No. 1. "The Truth About the Concrete Roads of Wayne Co."—October 7th, 1913, issue. A 16-page folder, 9x12, in which Paul E. Green, M. E., tells the story of his complete investigation for the tax-payers of Highland Park, Ill., by whom he was sent to get the truth. Profusely illustrated. $2.50 per 100; $12.00 per 500; $20.00 per 1,000. **1200 Left**

No. 2. "Creosoted Block a Failure"—November 4th, 1913, issue. Chicago's experiences with wood block graphically told in pictures and type in the form of a 4-page insert at $2.00 per 100; $5.00 per 500; $8.50 per 1,000. **4100 Left**

No. 3. "Chicago Concrete Streets a Failure"—March 7th, 1914, issue. A similar story of Chicago's experience with concrete instead of wood block as above, in the same form and at the same price. A valuable piece of literature in concrete road competition. $2.00 per 100; $5.00 per 500; $8.50 per 1,000. **1000 Left**

No. 4. "Gov. Glynn (N. Y.) Urges Use of Brick Roads"—April 7th, 1914, issue. An 8-page folder in which Gov. Glynn, of New York, not only gives his views on the exclusive use of brick for the highways of New York, but backs them up with indisputable facts. $4.00 per 100; $15.00 per 500; $20.00 per 1,000. **2000 Left**

No. 5. "Economy in Brick Paved Roads"—June 2nd, 1914, issue. An 8-page folder, containing address delivered by Will P. Blair, Secretary of the National Paving Brick Manufacturers' Association, before the First Canadian and International Good Roads Congress, held in Montreal, P. Q., May 18-23, 1914. It is well illustrated with numerous views of brick paved roads; and these pictures are the best answers that can possibly be given the advocates of concrete and other "so-called" permanent pavements. Prices: 100 for $4.00; 500 for $15.00; 1,000 for $20.00. **2000 Left**

No. 6. "Safe Factory Construction"—August 1st, 1913, issue. An 8-page folder. Prices: 100 copies for $4.00; 500 for $15.00; 1,000 copies for $20.00. **1000 Left**

No. 7. "The Silo—How to Make It Permanent"—October 21st, 1913, issue. An 8-page reprint. Prices: 100 for $4.00; 500 for $15.00; 1,000 for $20.00. **2000 Left**

Send Your Order Today to

Brick and Clay Record
445 Plymouth Court Chicago

displayed in the Mathews Gravity Conveyer as used in brick paving work. It has been endorsed, and is recommended by the National Paving Brick Manufacturers' Association, and has already been adopted by some of the largest paving contractors, such as Roehl Brothers of Cleveland, who have laid many miles of brick roads in Cuyahoga and adjoining counties. Here's a letter they recently wrote when asked as to their experience with the Mathews Gravity Conveyer:

> "When we use the 16-ft. conveyers we use two men to place the brick on the carrier and two men as setters. Thus using four men to each carrier. While we have these men setting, we have two men paving and we manage to lay 45,000 brick per day. (Each day being 8 hours.) By working the old way, it would take two extra men to do the same amount of work using wheelbarrows.
>
> "Further, we wish to state that another big advantage in using the conveyers, over wheeling brick is, when wheeling the brick, you gauge your pavement and bed full of holes and this costs money to level up. Thus we find that the big advantage in using the conveyers is convenience, simplicity, and the above mentioned saving. We cannot say enough for 'The Mathews Gravity Conveyers.'
>
> "(Signed) Roehl Brothers, Per Chas. Roehl."

We would suggest that every reader of "Brick and Clay Record" write to Mathews Gravity Carrier Co., Ellwood City, Pa., and ask for Bulletin No. 4. It will pay you to get the information it contains so you can help along the cause of brick for paving.

Get This Book—Free

"Du Pont Products" is the title of the most valuable booklet ever issued dealing with explosives, inasmuch as it explains clearly each of 251 distinct commodities, and tells how each should be used. It also gives a brief history of the Du Pont organization since its inception in 1802 and tells why it is more to the interest of the Du Pont company to have the United States at peace than at war. This is due to the fact that the work of the company is constructive—but get the book—it's free to readers of "Brick and Clay Record"—be sure to mention this paper. Address Sales Department—E. I. Du Pont de Nemours and Company, Wilmington, Del.

Garner Brick Company Improvement

The Garner Brick Company, of Haverstraw, N. Y., have added an excavator to their plant which it is said will do the work of at least 20 men. The machine takes the clay from the bank, mixes the different grades that are found from bottom to top and places it in cars to be carried to the pits. The excavator is the product of the

The Schofield-Burkett Excavator Saving Money for the Garner Brick Company, Haverstraw, N. Y.

Schofield-Burkett Construction Company of Macon, Ga., and was installed by I. E. Burkett, a member of the company. The working of the machine, which was tried out recently, was most satisfactory from every standpoint.

The Schofield-Burkett Company have received orders for more than a score of their excavators since January 1st, for erection at Eastern brick plants, and are working day and night to fill their orders.

One reason these excavators are being adopted so generally by these brick plants is because of their ability to excavate the different clays so accurately and economically. Particularly is this equipment a great boon to brick men at this time of scarcity of labor, altho even under normal conditions the Schofield-Burkett excavator has proven its worth.

Overcoming Lubrication Troubles

No matter how little your power costs you, it always costs too much. Therefore it behooves you to exert every practical effort to reduce the friction of every machine in your plant. Too often this is a matter of small moment to brick plant superintendents and managers, and the neglect of those in direct charge of mechanical details makes considerable difference in the operating cost column, even tho not discernible.

In the best brick plants, as in other manufacturing institutions, lubrication is an important item. They have made a study of oils and grease with the result that they do not fail to appreciate the advantages in such a system as the "Grease System" introduced to the industry by the G. B. Stock Xylite Grease & Oil Company of Port Huron, Mich. The old system of using a long-nosed squirt can has become obsolete in up-to-date plants.

Journals are made to run smoothly by the Xylite System, and this, of course, reduces friction and power required. By applying Xylite to the journal all the small imperfections of the metal in the bearing and journal are filled up, making a perfectly smooth, hard surface. Full information will be cheerfully furnished by this company, which also makes a complete line of oils, belt dressing and boiler compound.

Are You on This List?

"Leschen's Hercules" is the title of a monthly magazine that deals with excavating, building and tramway operations in every part of the world. The June issue is especially interesting, one article dealing with a tramway system 31,500 feet long by which zinc ore is transported from the Puerto Rico mine in Mexico across the Rio Grande into Texas. This is especially interesting because of the recent raid on the mine by Mexican bandits—the operators of this tramway were captured, but escaped because of the daring of one of their number. Photographs and drawings make this story mighty interesting.

The same issue also contains other articles and photos that cannot help but hold one's attention. If you are not getting this magazine, write to A. Leschen and Sons Rope Company, St. Louis, Mo., and they will put your name on the list. There is no cost to you—subscription is free—but be sure to mention "Brick and Clay Record."

An Effective Boiler Scale Remedy

Every automobile driver knows how necessary it is to keep the cylinders free from carbon—even a small deposit causes loss of compression and lack of power, while

EBONITE Does Not Harden

EBONITE will not burn out, blow out, rot out, carbonize, crumble or decay. It retains its "life" indefinitely and the same ring may be used over again one or more times, because EBONITE remains soft and pliable.

All EBONITE specialties possess the same properties as the sheet packing.

EBONITE SHEET PACKING
EBONITE PUMP VALVES
EBONITE STEAM HOSE

Keep in mind the fact that we manufacture a complete line of Mechanical Rubber Goods—Belting for all purposes, Valves, Hose of every description, Moulded Shapes, etc.

Our corps of experts is always at your command to help solve problems relating to rubber goods.

A Handy Buyers' Guide, FREE

This book contains 60 pages, 3¾ x 6-in., printed in colors. It describes many kinds of Mechanical Rubber Goods, and gives valuable tables of belt, packing, hose, etc., sizes.

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Employed by ....
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Quaker City Rubber Co.

PHILADELPHIA 629 Market St.
CHICAGO 182 W. Lake St.
PITTSBURGH 211 Wood St.
NEW YORK 207 Fulton St.

SAY I SAW IT IN BRICK AND CLAY RECORD

The Price of Coal

subject to such uncertain conditions as exist at the present time, demands that you keep a watchful eye and an open ear upon this big factor of your operating expense.

The price of coal will not be any lower than it now is, and will undoubtedly go much higher within the next few months, because of the material increase in miner's wages and mining supplies.

THE BLACK DIAMOND

Each weekly issue of THE BLACK DIAMOND treats with conditions as they arise, and tells of the probable bearing they will have upon the future price and supply of coal.

Considering the small cost of but 6c a week ($3.00 a year), THE BLACK DIAMOND is the cheapest, safest and most satisfactory form of fuel insurance a clay-product manufacturer can carry.

Follow the path of live and progressive brick and tile makers everywhere, and become a regular reader and subscriber to THE BLACK DIAMOND,—for over 30 years the coal trade's leading journal.

Write now for a sample copy.

THE BLACK DIAMOND

111 MANHATTAN BLDG.
CHICAGO, ILL.
NEW YORK PHILADELPHIA PITTSBURGH

failure to remedy the trouble causes a "knock" and finally bad cylinders. He also knows that all of this trouble can be avoided by simple precautions.

And exactly the same condition exists in brick plants so far as boilers are concerned. There isn't a single steam-power plant in existence that doesn't have more or less trouble from scale, which corresponds to the carbon in an automobile cylinder—except it is easier to detect in the automobile than in a boiler. But it's this very fact that makes boiler scale dangerous, causing loss of power and use of more fuel than should be necessary.

There isn't any excuse for this condition—all that is necessary is a little care, watchfulness, and once-a-month use of Illinois Boiler Cleaning Compound. This compound is not like any other—you don't need to use it oftener than every 30 days, and it will not injure the boiler. It is prepared in either liquid or powder form and one small package will keep a 50 h. p. unit free from scale.

Every reader of "Brick and Clay Record" should write to Illinois Boiler Cleaning Compound Company, 127 N. Dearborn Street, Chicago, and find out how easy it is to avoid loss of fuel—and even possible boiler accidents which are so commonly caused by scale.

Grand Prize to the Bristol Company

In the face of very strong competition at the Panama-Pacific International Exposition held at San Francisco last year, The Bristol Company of Waterbury, Conn., manufacturers of electric pyrometers, was given the Grand Prize.

In view of the fact that this exposition was the most extensive industrial show in the world's history, this is even more than usual, a signal honor.

The Bristol Company has developed a pyrometer installation that has a combination indicating and recording unit which is especially recommended for clay-products plants. They will be glad to send full information regarding their instruments to anyone making request for Bulletin 205.

Belt-Fixing Accidents Avoided

Did you ever try to fix a belt? Did you ever watch someone else do it? If you did, it ought not to take any

The "Straight-Line" Belt Adjuster Saves Time and Prevents Accidents when Belts Have to be Handled

argument to convince you that it's one of the most dangerous pieces of work any man around the plant has to do. And it's costly too, because of the length of time it takes.

But there's no use worrying about it. Do as hundreds of others are—use the "Straight-Line" Belt Adjuster—your belts can be fixed in a jiffy and with absolutely no danger to your men. In the avoidance of accidents and saving of time, one of these adjusters will soon pay for itself. In fact its value is incalculable because the cost is small.

The "Straight -Line" Belt Adjuster is easy to carry—can be applied to overhead or difficult drives—it can not slip because the worm-gear drive is positive. It is sold on 30 days' free trial by the Cleveland Fabric Belting Company of 1480 W. 110th Street, Cleveland, Ohio.

It's All in the Burning

William Sherwood, of Payette, Idaho, has been making brick for 25 years. For the past 15 years he has been owner and manager of the Payette Brick Yards, and the ten years previous were those of his apprenticeship in brickmaking. Since his ownership he has enlarged and modernized his plant until now it is equipped with the best machinery, and working at full capacity.

Mr. Sherwood is making better brick every year. He says the secret of brickmaking lies in the burning, and when the kilns of the Payette yard are set, ready for burning, Mr. Sherwood takes his meals and even sleeps in sight of that burning. Consequently the result is something that costs money. He now has three kilns, and has made arrangements to add a fourth.

The Boss System of brick burning is the one used. A 7½ h. p. electric motor operates the powerful fan that makes possible a draft sufficiently strong for the burning of slack, the cheapest grade of fuel furnishing heat for the burning of the brick. The brick machine is operated by a 20 h. p. electric motor.

Hard, fine textured brick, of even color, are produced at this plant, and have been used in many of the public and business buildings of Payette. Mr. Sherwood advises that he has orders in hand to take care of his output for the entire season.

Clay-products manufacturers often have occasion for expert service for testing and analyzing their material, and will therefore welcome the coming of Robert W. Jones, 17 Magnolia Terrace, Albany, N. Y., into more direct contact with this field.

Mr. Jones is a graduate mining engineer, and has had considerable practical experience along this line. He has also been engaged in government work in the geology of ore deposits, structural materials and clays, laboratory testing and chemical analysis of crude materials and finished products; inspection of plants with regard to labor conditions, costs and methods of manufacture, topographic surveying, sampling and estimating of quantity in clay lands.

From the above brief outline of the work he has been engaged in, it can be readily seen that Mr. Jones is well equipped to render efficient service in the clayworking industry.

A Successful Kiln Grate

Every one who has ever had any experience tending kiln fires knows how hard it is to sift the ashes without disturbing the fuel bed. He knows too that any device

How Do YOU Buy Coal?

Did you read that splendid article in the June 6 issue of "Brick and Clay Record"? Remember this sentence?

> "The biggest problem in fuel economy before the (clay products) manufacturer today is to obtain the most reliable information on available costs in the best, easiest and quickest way."

That's what other clay product manufacturers have done—and they've done it by asking us for coal information and data—then by making a thorough test of

Livingston or Nokomis Coal

(*They're both excellent*)

We have had quite a wide experience in connection with the use of coal on clay plants and we'll gladly tell you about it if you'll ask us.

If you are really seeking the best coal for your needs at prices that you can afford to pay, write us.

We can ship anywhere west of Indiana on Big 4, C. & E. I. and I. C.

Rutledge & Taylor Coal Co.

St. Louis, Mo. Chicago, Ill.

"Samson
Interlocking Tile"
Patented

In the above cut a construction of Samson Interlocking Tile is shown, which is the most modern form of construction for dry kilns, refrigerators and small residences, as it is almost impossible for moisture, heat, frost or sound to strike through walls built in this manner.

The construction on the left shows a wall commenced at 21 in. and reduced to 9 in. This is an exclusive feature of Samson Tile.

SAMSON INTERLOCKING TILE builds any thickness of walls without the use of other forms of tile, those and other exclusive features make this the most modern building material.

Three tests of SAMSON INTERLOCKING TILE, made at the University of Wisconsin, show respectively the following crushing strength: 1060, 1310 and 1040 lbs. per sq. in. This will give you some idea of the great load bearing capacity of "SAMSON INTERLOCKING TILE."

Write today for Manufacturing rights for unrepresented districts.

W. W. SMITH
Shallow Lake, Ont. Canada

that will overcome this trouble must be a big fuel saver.

The Armstrong Standard Interlocking Kiln Grate does this because of one of its patented features: interlocking fingers. It not only enables one to sift the ashes gently without disturbing the fuel bed, but it also keeps all the air spaces open. Just one movement of the dumping device entirely cleans the fire, clinkers even six inches thick being easily handled.

The Armstrong grate locks rigidly in a perfectly flat position—the fingers never project above the surface. Each grate and operating device is mounted and evenly balanced on a truck so the entire bed of fuel can be instantly removed whenever desired.

The grate has a front designed to meet all varying kiln shapes and forms, with handy door openings for charging, inspecting, leveling, exit and entrance of grates, and for regulation of air supply.

The Armstrong Company, manufacturers at Springfield, Ohio, will ship their grate to a brick plant anywhere, install it at their own expense, allow a reasonable time for trial, with the understanding that it will be removed if not entirely satisfactory. This offer is worthy of consideration—they will send details on request.

Increased Cost of Brickmaking Machinery Material

The manufacturers of machinery used in the clayworking industry call attention to the increased price of materials entering into the construction of brick and tile making machinery. The difference in prices now prevailing and those of a year ago are as follows:

	1915	1916	Increase
Pig iron	13.00	19.50	50%
Steel bars	1.05	3.15 to 4.25	200 to 300%
Plates	1.05	4.25	300%
Brass tubes	.16	.42	160%
Forgings	2.40	6.00	150%

These facts should of course be taken into consideration when making estimates on the cost of new machinery.

Machine Cut Gears Versus Cast Tooth Gears

Your own mechanical engineer will tell you that cast tooth gears waste in power many times their first cost, and many more times the difference between their first cost and the first cost of machine cut gears, which you imagine is a saving.

The efficiency of cast tooth spur gearings varies between 60 and 80 per cent., depending upon the effects of shrinkage and the accuracy of the moulding. The efficiency of cut spurs varies between 95 and 98 per cent., depending upon the accuracy of the machine work.

Cut teeth are evenly spaced and of even thickness, and the outside diameter of the gear is a true circle, concentric with the bore, which cannot be accomplished in *any* unmachined casting owing to shrinkage.

No filing or allowances for uneven teeth or spacing are necessary in installing cut gears, as the teeth mesh truly, with the gears on proper center, consequently there is a minimum labor in mounting, minimum backlash and vibration in operating, no possibility of breaking teeth due to concentration of load on high spots, and no possibility of breaking gears, shafts or bearings due to the sudden strains caused by eccentricity. Cut teeth are engaged for the entire length, insuring even distribution of load and wear.

Tell Nuttall your operating conditions, give them the dimensions of any of your cast gears, or send a sketch if you can. They will tell you the cost of equivalent cut gears and guarantee them to save their cost many times over. Address R. D. Nuttall Company, Pittsburgh, Pa.

Much the Largest Manufacturers of Clayworking Machinery in the World.

THE AMERICAN CLAY MACHINERY COMPANY
BUCYRUS OHIO

A Hog for Rooting

The AMERICAN STEAM SHOVEL is a "Hog for Rooting" and will be found better yet for Clay Pit use.

The clay worker who desires to put his clay on the dump cars at the lowest possible cost will find The American Steam Shovel best adapted for his work.

The American Steam Shovel has been designed expressly for the Clay Worker and possesses several features that adapt it especially for the clay pit.

It is an excellently built shovel, amply heavy to do a big shovel's work. It carries a seven-eighths-yard dipper and does its work easily. It is handy and compact. Operators prefer its convenient arrangement to other shovels and turn out a proportionately large day's work.

The American Steam Shovel is adapted for other work about the plant and can be kept busy.

Send for our Steam Shovel catalog. It is full of details, pictures and dimensions. It tells the whole story of excellence of this shovel.

We build every machine and appliance required by the Clay Worker.

The American Clay Machinery Co.
Bucyrus, Ohio

SAY I SAW IT IN BRICK AND CLAY RECORD

Brick and Clay Record Buyers' Directory of Manufacturers of Machinery, Equipment and Supplies

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Wallace Mfg. Co.

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Steel Towers.
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Trautwein DRYERS

What Trautwein Service Means--

As manufacturers of Dryers and Dryer Equipment we are prepared to study the conditions at your plant—to make a commercial test of your clay to determine what method of drying will best suit your needs—

We have no single set design or ideas to force upon you.

Also—as Engineers we have gained an enviable reputation as Complete Plant Builders, and we can point with pride to our achievements.

Yet—we are also just as proud of the fact that our recommendations have kept many misguided enthusiasts from disastrous ventures when we showed them that they did not have a proposition that could be made a commercial success.

If That's the Kind of Service YOU Want—

Write us—tell us of any conditions in your plant that may be bothering you—or of any plans you have in mind. There will be no obligation—rather will it be a pleasure to study your problems.

Trautwein Dryer & Engineering Co.

Manufacturers of Drying Equipment
ENGINEERS—
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BURNING KILNS
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IS OUR SPECIALTY

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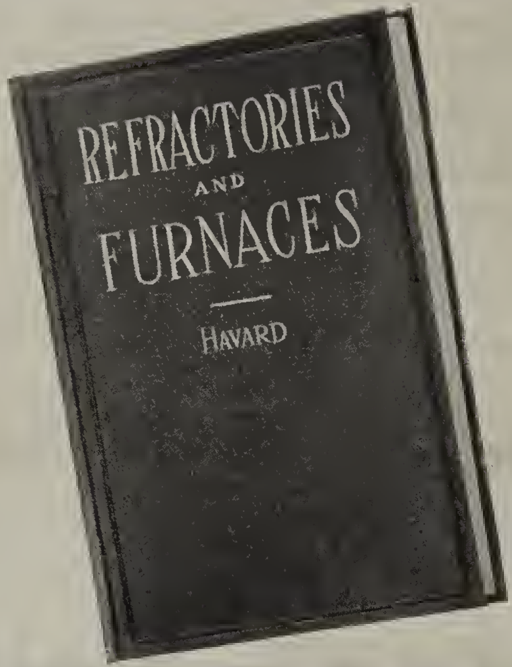

356 Pages, 6x9, 123 Illus. . . . . . $.400

THIS BOOK is based on notes made during the author's activities as superintendent of furnace operations in America, England and Germany. It digests, besides, all of the available information on the properties and preparation, sources and processes of manufacture, of the materials with which industrial furnaces are built. It includes, furthermore, a comprehensive study of the physical and chemical properties of these materials.

The author has aimed to bring some order out of the chaos which has hitherto existed in the data on this subject, and to correlate and systematize the available information.

He first classifies refractory materials and discusses the relations between slags and these materials. He then goes into the question of the preparation of the various kinds of refractories and their uses in the various metallurgical processes. He gives valuable data on the construction of furnaces, the testing of refractory products, the thermo-physical properties and heat measurements.

He undertakes to promote efficiency in furnace work and a reduction in the cost item of furnace repairs and masonry. He has been assisted by a number of specialists and manufacturers in the preparation of the material that appears in the pages of this valuable work. The book is for sale through "Brick and Clay Record's" Book Department, at $4.00, postpaid.

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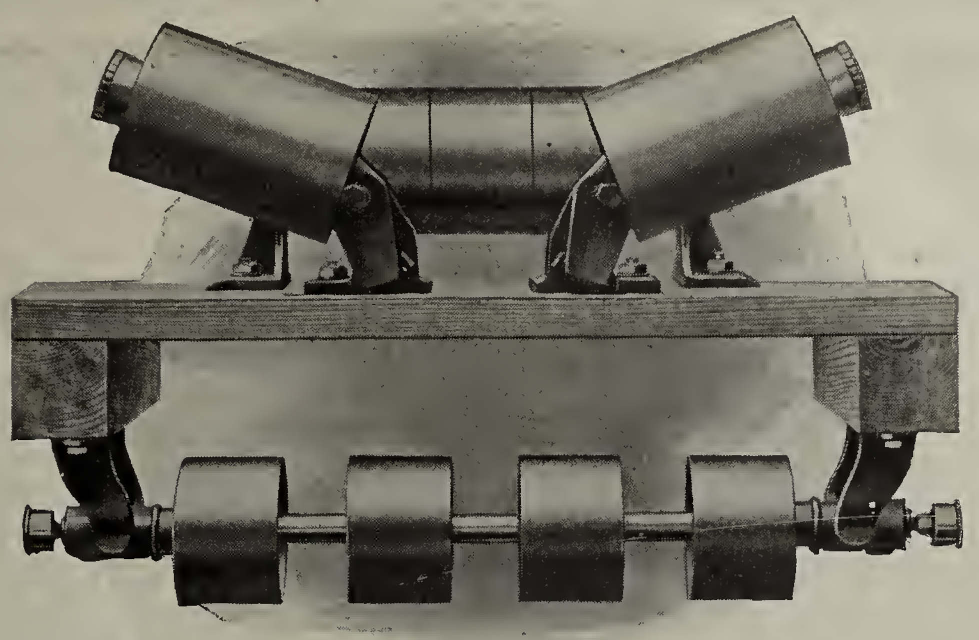

The MAIN Adjustable Conveyor Roller

HERE is a conveyor roller that lets a belt earn its cost.

It has troughing rollers adjustable to a maximum of 20°, self-adjusting bearings, positive lubrication, reinforced rims on the troughing rollers *and no* gaps or openings between pulleys to cause belt wear.

These things put belt wear up to the material carried and in many cases mean double service from each belt.

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TRANSMITTING
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¶ Book "2" will be helpful to every man who has to do with conveyors—there is a copy awaiting you if you ask now. A postal will do.

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Main Belting Company of Canada, Ltd.

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THE GARNER BRICK CO., HAVERSTRAW, N. Y. ELIMINATE 20 MEN BY THE ERECTION OF THE

Schofield-Burkett Excavator

And they not only do away with this big cost item—reducing their overhead—but they are able to get an absolutely accurate and uniform mixture of their various clays.

WHAT DOES THIS MEAN?

That The Garner Brick Co. will hereafter make a better quality of brick at a lower cost than ever before—hence a better profit for themselves and no worry from competition.

Why don't **you** find out what we can do for **you?** This is our proposition:

We agree to superintend installation of a machine for you and demonstrate that it will load your material at a certain cost per cubic yard, and will demonstrate to your satisfaction before settlement is expected.

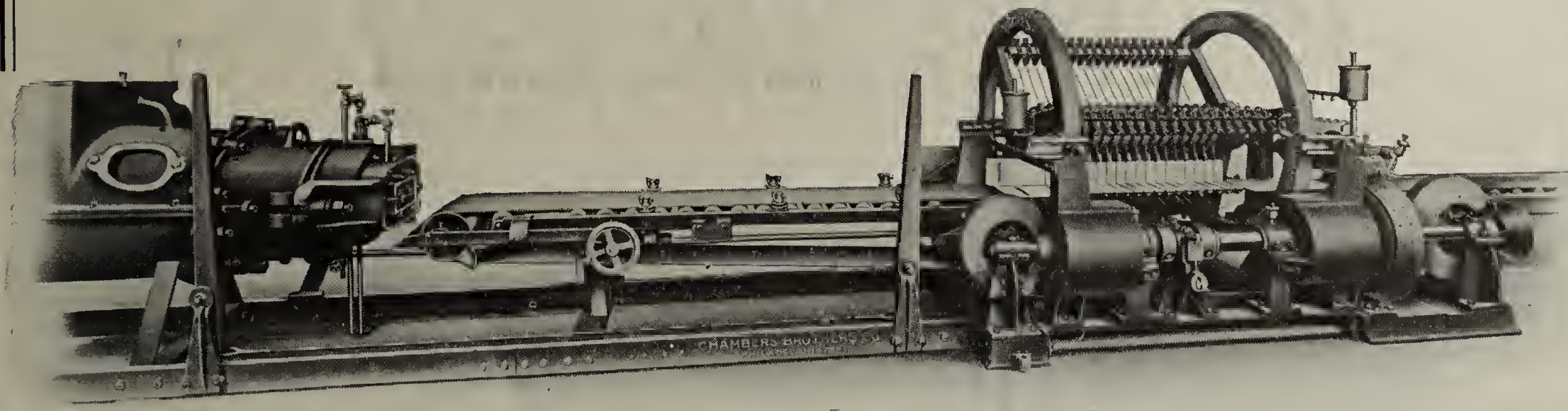
Ask us for Catalog No. 10 and the names of those we are serving.

Schofield-Burkett Construction Company
Macon - - - Georgia

SAY "I SAW IT IN" BRICK AND CLAY RECORD

Chambers Brothers Co., Philadelphia, Pa.

Clayworking Machinery Developed Through a Careful Consideration of the Criticisms of Experienced Brick Manufacturers



THE BRICK CUTTER THAT DOES NOT SWELL THE CLAY-BAR

Built so far as possible, to a standard for the construction of machinery of this class

We refer by permission to

The Mill Hall Brick Works	Mill Hall, Pa.
The Reynoldsville Brick & Tile Co.	Reynoldsville, Pa.
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The Kier Fire Brick Co.	Pittsburgh, Pa.
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W. G. Bush & Co.	Nashville, Tenn.

These Are All Well Known Concerns Whose Managers Investigated and Then Selected The

Chambers Multiple Brick Cutter No. 10

YOU CAN'T GO BACK OF FACTS

Progress comes from proper development of theory—which takes confidence and capital. Then—we have facts—and you can't go back of facts.

THE UNDERWOOD PRODUCER GAS BURNING SYSTEM

(Patented)

is a case in point. It long ago passed beyond mere theory—the experimental stage. Every claim made for it today is based on FACTS—and with these facts to sustain us, we challenge anyone to scrutinize our claims and to disprove a single one. Yes—we go further—we prove our claims by facts.

LOOK CLOSE AT THESE EXHIBITS

—they give absolute facts obtained direct from The Keller Brick Co. of Cuyahoga Falls, Ohio, as to comparative burning costs by direct coal fire and by the Underwood System. The original papers are in our office and open to the inspection of anyone. We have nothing to hide.

Extracts from Data Sheets submitted by Keller Brick Co., July 28, 1915, prior to installation of Underwood System.

How many rectangular downdraft kilns?
Answer—Four.
Do you make building brick?
Answer—Yes.
Do you use bituminous coal?
Answer—Yes, ¾ and R/M.
State quantity used to burn 200,000 building brick.
Answer—100 tons.
Maximum temperature?
Answer—1900° F.
Time required to water smoke?
Answer—18 to 24 hours.
Time required to burn each kiln?
Answer—5 to 6 days.

A Daily Burning Report submitted by Keller Brick Co., May 10, 1916, after installation of Underwood System.

Name of company—Keller Brick Co.
Address—Akron, O.; Cuyahoga Falls.
No. 1 Rectangular Downdraft Kiln. Contains — Brick, 200,000.
Date when filling was finished—5/5.
State manner in which material was set in kiln—Same as usual.
Is ware in kiln about to be burned well dried—Same as usual.
Date when fires were started—5/5, 4 p. m.
Date, 5/10; temperature, bottom, 1875°, 1975° F., at 1:30 p. m. Total settle, 9 inches.
Date, 5/10; coal consumption, 66 tons at 6 p. m.
What grade of coal is furnished for use—Piney Fork.
State condition of gas—Good.
Remarks—Bottom good and hard.
Chas. Keller, Pres.

And—we not only shortened their burning period and used less fuel—but we also enabled them to make a face brick out of the same clay which is selling at double the price they were getting for the best quality they could previously make.

Need we say more to convince even the most skeptical? If you are open-minded—if you really are in earnest about wanting to save fuel costs and make a better product—write us. We have plenty of evidence and we'll go anywhere to lay it before you.

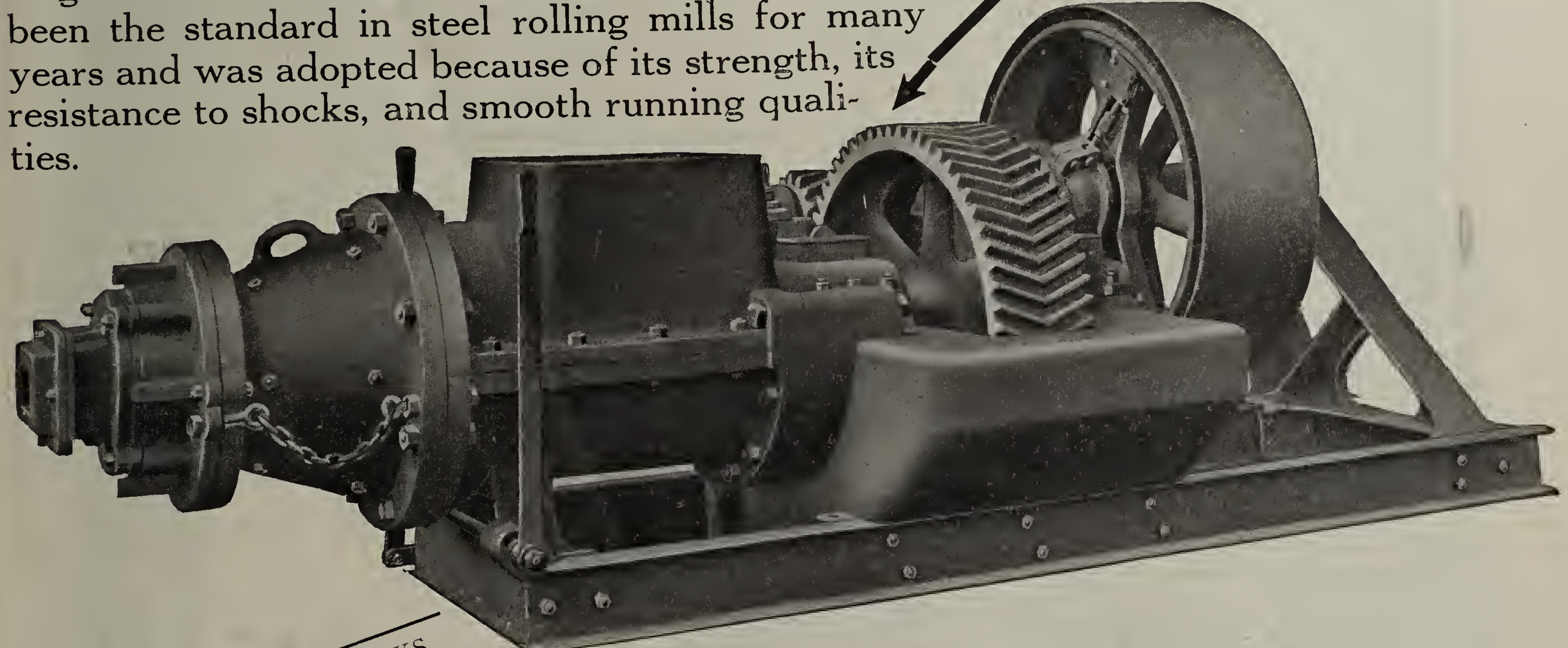
The Manufacturers Equipment Co., Dayton, O., U. S. A.

A Brick Machine Is No Stronger Than Its Gears

That's the reason particular attention is given to the gears used in each model of

Bonnot Clayworking Machinery

For instance—in our No. 18 machine, shown here, and which is made for heavy work, with a capacity of 6,000 to 7,500 standard size building brick per hour, we use the Herringbone or double Helical type of gear. This has been the standard in steel rolling mills for many years and was adopted because of its strength, its resistance to shocks, and smooth running qualities.



OMAHA CLAY WORKS
OMAHA, NEBRASKA

AUGUST 10, 1915.

THE BONNOT COMPANY,
909 New York Life Bldg.,
Kansas City, Mo.

Attention Mr. Roy G. Smith.

GENTLEMEN: We are glad to express our satisfaction with all of the machinery and equipment we have purchased of you during the past four years.

We also wish to thank you and express our appreciation of the interest you have always shown in the welfare of our concern and the working of the equipment you furnished us.

Our business relations with you have been both pleasant and satisfactory.

Very truly yours,
OMAHA CLAY WORKS,
BY A. Hansen.

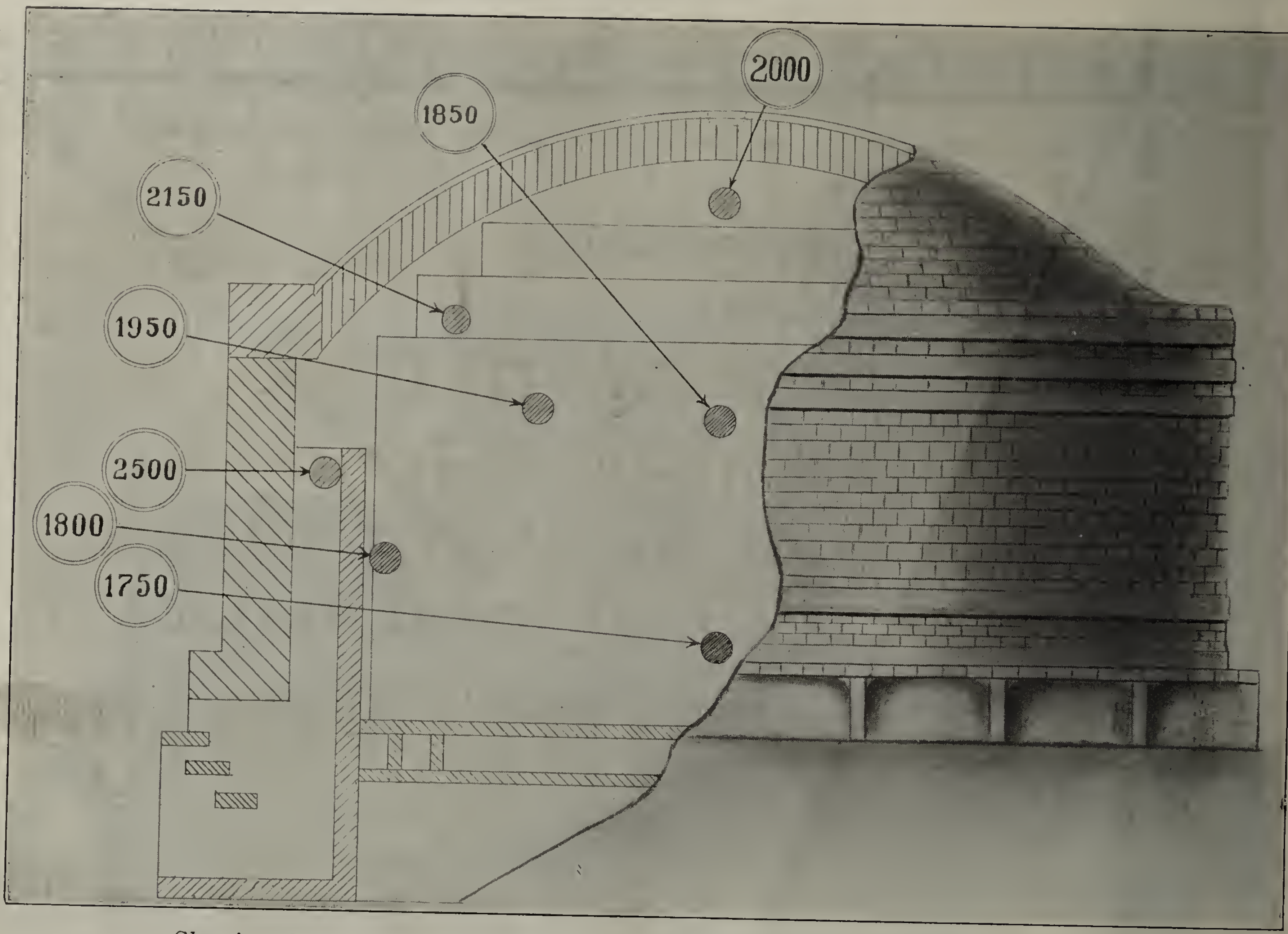
The Bonnot No. 18 Machine has a gearing with 12-inch effective face. Both the gear and pinion are cast from high-grade open hearth steel and are machine molded, thus making them next to machine cut gearing in accuracy. It is guaranteed to stand rough work and hard shocks. When in use, the gears are covered with a sheet-metal cover which is dust-proof. There is also a reservoir so the gears can be run in oil, if desired.

The frame is cast in one piece and is perfectly rigid. The auger chambers, drum and frame are machined at all joints so there is perfect alignment of all the parts. The main shaft is hammered steel 6-in. diameter and counter-shaft 4½ in.

You ought to get acquainted with our No. 18

THE BONNOT COMPANY - - - Canton, Ohio

"Let Us Standardize Your Plant"



Showing the necessity of a knowledge of temperatures in all portions of the kiln

The

$25.00 **"I-RITE"** **$25.00**

TEMPERATURES AT SIGHT

will accurately measure the temperature of the

Brick Itself

—at the top of the kiln.
—at the bottom of the kiln.
—on all sides of the kiln.
—in the heart of the kiln.

and is the mechanically perfect eye for obtaining temperature readings at any point in the kiln which is visible.

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Highland Bldg., Pittsburgh, Pa.

SPECIAL INTRODUCTORY OFFER

INDICATE RANGE AND NUMBER OF INSTRUMENTS

Date..

We hereby agree to accept from the Gibb Instrument Co. .... "I-RITE" pyrometers, Range 1000F to 1800F, 1700F to 2600F, which we will use for five days. If we are not satisfied with the "I-RITE" we will return same for full credit and be under no further obligation. If satisfactory we agree to pay to the Gibb Instrument Co. twenty-five ($25.00) dollars, terms cash, for each instrument.

Name and Title..
Firm ....
Address ....

SIMPLICITY HONESTY

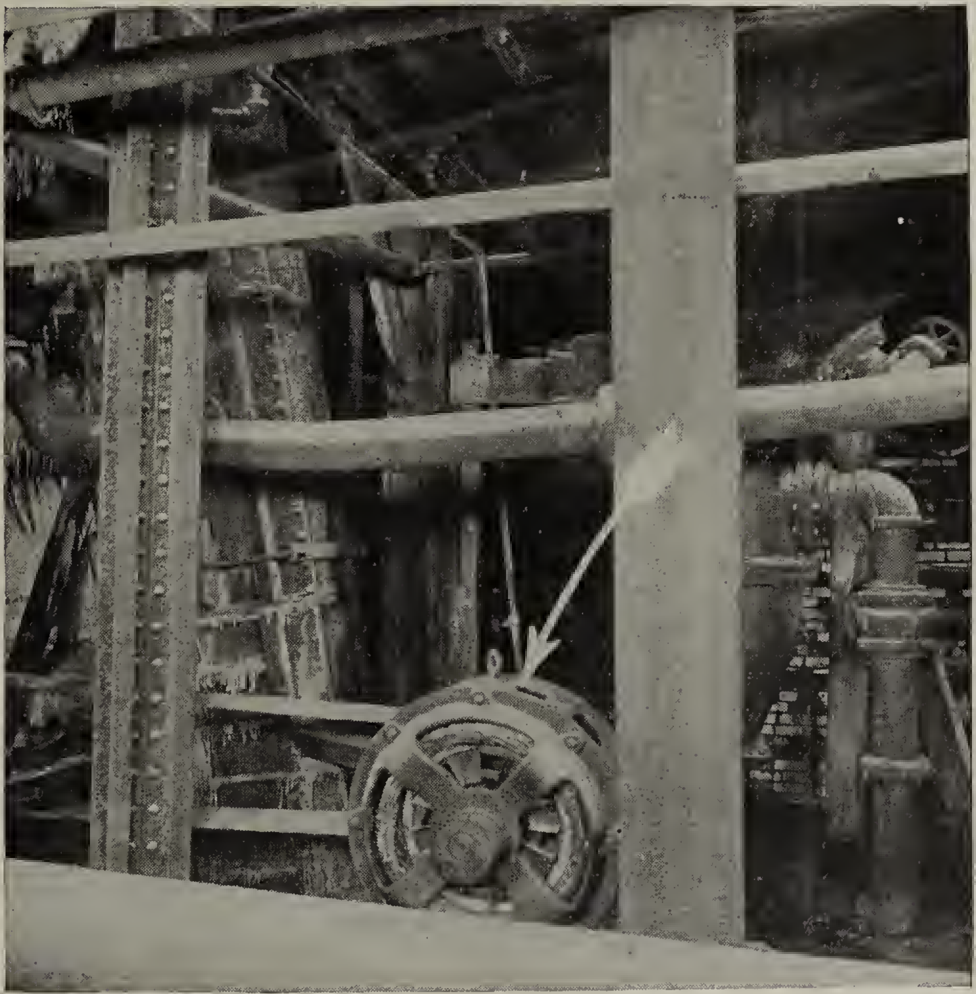
LINCOLN MOTORS

Nothing But Motors

The Lincoln Motor is good enough to occupy the entire attention of its manufacturer

The Lincoln production department concentrates its whole energy on making this one simple piece of machinery—and making it right.

The Lincoln engineers have no "hobby" save improving Lincoln Motors and adapting them to brick and clay machinery and other special requirements.



Lincoln Motor driving pump under severe moisture conditions.

The waterproof insulation of Lincoln Motors is an example of what specialization has done.

"Link Up With Lincoln"

The Lincoln Electric Co.

Cleveland, Ohio

Buffalo **Chicago** **Columbus** **Detroit**
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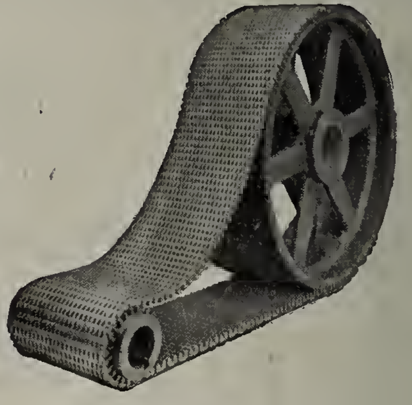
Agencies in other principal cities.

SAY I SAW IT IN BRICK AND CLAY RECORD

Link-Belt Silent Chain

"In Fine Condition After 22 Months' Operation"

The Ohio Clay Company uses Link-Belt Silent Chain for transmitting to a lineshaft all the power required for machinery producing approximately 125 tons of Denison Interlocking Tile per day. After 22 months of service, an inspection was made of the drive—



Flexible as a Belt.
Positive as a Gear.
More efficient than either

Here are Mr. George W. Denison's words:

THE OHIO CLAY COMPANY
8th Floor Hippodrome Bldg.

Cleveland, Ohio, May 5, 1916

The Link-Belt Company,
1304 Rockefeller Building,
Cleveland. Ohio.

Gentlemen:--About two years ago we purchased from you a 150 H. P. Link-Belt Silent Chain Drive. This transmission has been in daily operation since it was installed, driving all of the brick machinery which has been producing approximately 125 tons of Denison Interlocking Tile per day.

After this drive was in operation for 22 months we removed the cover to inspect the chain and clean it, if necessary. The writer personally inspected the chain and sprockets, and much to his surprise was unable to detect any wear.

We feel that on account of this remarkable service we owe it to your company to state the above facts.

Yours very truly,
THE OHIO CLAY COMPANY.
(Signed) George W. Denison, Vice-President.

We invite you to discuss your transmission problems with us. Link-Belt Engineers know your field and can show you where savings can be made through the use of Link-Belt Silent Chain Drive.

The secret of the success of Link-Belt Silent Chain is due to its patented Pin-Bushed—Joint construction—a round pin and two case-hardened semi-circular bushings—found in no other chain.

Look for the liners in the joints

Look for the name on the washers

Write for Bulletin No. 91, showing some of our Clay Working Machinery Drives.

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Louisville....F. Wehle, Starks Bldg.
Seattle..........580 1st Ave., South
Portland, Ore....14th & Lovejoy Sts.
Los Angeles..161 N. Los Angeles St.
Toronto....Can. Link-Belt Co., Ltd.

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the guarantee of
excellence on
Goods Electrical

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Electric Power Speeds Production

Use electric power in your plant as you use the telephone and telegraph in your business. With electric power speed up production as you increase personal efficiency.

This power from G-E motors and controllers meets every requirement of your machines—whether you wish quick or slow starting and braking, constant, variable or varying speed, etc., and this adaptation means more and better product.

The perfect reliability of electric power from G-E motors and controllers keeps the wheels turning twenty-four hours a day, year in and year out, if necessary—production is greatly increased.

Our engineers have solved all kinds of industrial power problems. You are invited to avail yourself of their suggestions when considering means for increasing production.

General Electric Company

General Office: Schenectady, N. Y.

6138

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"SCANDINAVIA"

(Solid Woven Cotton Belt)

Is that when a power plant once starts to use it, there is no necessity of our trying to sell them any more—they simply come to us for all their belting needs.

There is no magic about "Scandinavia"—it is simply in the superior construction. It is stout and tough——it has no laps or plies, but is solid woven. This gives it one hundred per cent gripping power, which means that it delivers more horsepower than rubber or stitched cotton belting, and at a uniform rate.

Also—"Scandinavia" is not affected by steam, water, oil or dust. That's another reason why "Scandinavia" has come to be known as the brick man's belt.

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This Pittsburgh Brick Plant (Name on Request) Has Been Equipped Throughout with "Scandinavia" Since 1910.

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Illinois Boiler Compound
A SCIENTIFIC MIXTURE
It REMOVES BOILER SCALE Absolutely
It enables you to hold constant pressures with less fuel and less risk. The cost is low —Write today.
The Illinois Boiler Cleaning Compound Company
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Mfrs. of Medium and Large GAS ENGINES and COMPRESSORS
SPRINGFIELD - OHIO

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"Just a hammer to apply it"
FLEXIBLE STEEL LACING CO.
522 S. Clinton St., Chicago

Chain Hoists — Trolleys
"Wright" HIGH SPEED STEEL HOIST
"Wright" STANDARD SCREW HOIST
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The "HOVALCO"
Blow-Off Valve
is regrinding and renewable. All parts replaced with ease. It is unconditionally guaranteed for this work.
Homestead Valve Mfg. Co.
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NUGGET FITS YOUR LADLES **BABBITT**
For every bearing on the plant.
It costs but 18 cents per pound.
One hundred other brickmakers buy it, use it, like it, and stock it.
What is your address?
The Cleveland Alloys Co., Cleveland, Ohio

GET THE HABIT— BUY HERE — WE'LL TREAT YOU RIGHT

EVERY TIME—
SAY "I SAW IT IN BRICK AND CLAY RECORD"
THAT'S IT

EXPERT SERVICE TO THE CLAYWORKER
Construction and operation of down-draft, continuous or producer-gas kilns, dryers and complete plants. Drawings for all purposes. Glazes and slips developed. Troubles in kilns, dryers and machinery quickly remedied. Investigation of property, testing clay, etc. Ask my references.
Rich. B. Hoehne, 3833 Windsor, St. Louis, Mo.

Taylor Mesaba Steam Shovel Chain
Strictly hand welded by expert workmen and made from a special rerolled double refined iron.
Sizes carried in stock for immediate shipment: ⅞, 1, 1⅛, 1¼, 1⅜, 1½ and 1⅝ inches.
S. G. TAYLOR CHAIN COMPANY
138 S. Dearborn St., Chicago, Ill.

RED BRICK COLOR
For coloring the moulding sand for sand-moulded brick. Greatly improves appearance of brick at small cost. $15.00 per ton Eastern and most Middle State points.
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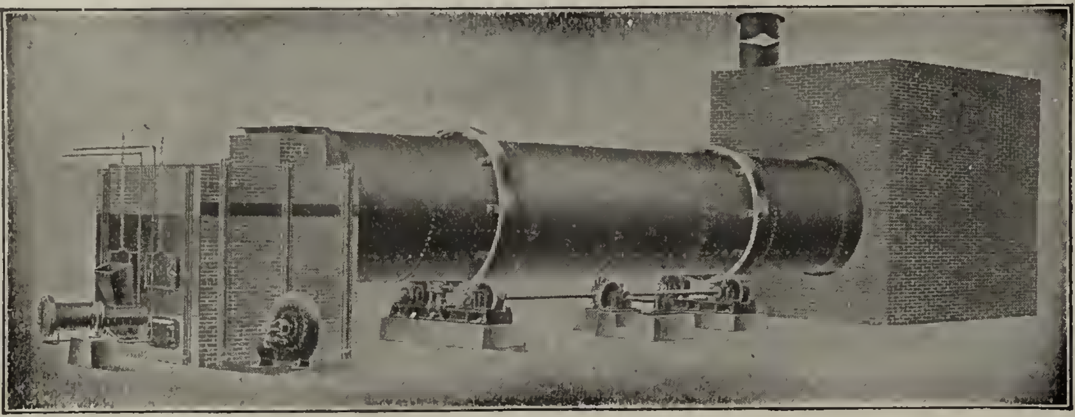
The Garnet Process Belt Treating Products for
BRICK AND CLAY PLANTS
Sure in its preserving and proofing quality.
POSITIVE PULLEY CONTACT.
Clean, Economical, and Satisfaction Guaranteed.
Advise your requirements and kind of belting used, in letter today to
The Garnet Company, Allentown, Pa., U. S. A.

IT WILL PAY YOU TO SHOP IN THE GENERAL STORE

Yellow Strand Powersteel Truckline
Easily moves two freight cars. The breaking strain is 12 tons. Cost $6.50 each.
Broderick & Bascom Rope Co.
703 N. Second Ave., St. Louis

SAY "I SAW IT IN BRICK AND CLAY RECORD"



ROTARY CLAY DRYER

DRY YOUR CLAY

AT LOW COST

YOU CAN THEN OPERATE IN ANY WEATHER OR SEASON

It Assures Uniform Product

YOU CAN THEN SCREEN TO ELIMINATE PEBBLES, ETC.

American Process Co.
68 William Street
NEW YORK

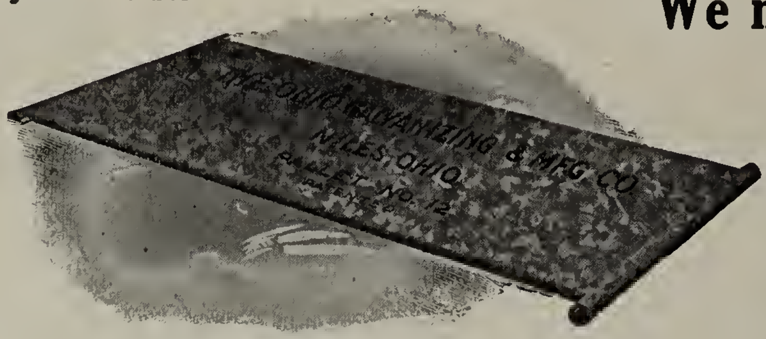
THE CHASE DRYER CARS

With patented flexible and reversible boxing and roller bearings

The *Best Equipment* is the Equipment that gives you the *Best Service*

The Chase Fdry. & Mfg. Company
Columbus, Ohio

Style No. 12



A Time and Money Saver

We make a Steel Pallet that is just exactly what your class of work requires

Our line of manufacture covers the entire Steel Pallet field.

No matter what pattern you need. If you require something quite out of the ordinary, so much the better. We can make it right, deliver it promptly and for the least price. Because we are specialists in this particular line.

Simply let us know what you need or send for complete descriptive matter.

The Ohio Galvanizing & Mfg. Co.
Niles, Ohio

"HAVE SOLD EVERYTHING —but boiler and engine"

That is what a classified ad did for one advertiser. You try it. Eight cents per word for first insertion and six cents per word for each additional insertion.

BRICK AND CLAY RECORD, 445 Plymouth Court, Chicago

Trade Names Now in Use

on Face Brick and Other Clay Products

The purpose of this directory is twofold; it serves to prevent a manufacturer from adopting a trade-name that is already in use—and it also helps manufacturers who use it to establish priority of claim to a name.

Algonquin—Alliance (O.) Brick Co.
Ante-Fired—London (Ont.) Pr. Bk. Tile Co.
Arabian—Dublois & Butler Co., Falls Creek, Pa.
Armor—Greenpoint Fire Brick Co., Brooklyn, N, Y.
Artbrique—Yingling-Martin Brick Co., Johnsonburg, Pa.
Astrakhan—Columbus (O.) Bk. & Terra Cotta Co.

Beaverclay—Beaver Clay Mfg. Co., New Galilee, Pa.
Belden—The Belden Brick Co., Canton, O.
Bessemer Block—Bessemer Limestone Co., Youngstown, O.
Big Four Block—Big Four Clay Co., Canton, O.
Bokhara (Hy-tex)—Hydraulic-Press. Bk. Co., St. Louis.
Bossage—Hanover Red Pressed Brick Co., Newark, O.
Brocade—Toronto Fire Clay Co., Toronto, O.

Caledonian—Fiske & Co., Inc., Boston and New York.
Car-Bex—London (Ont.) Pr. Brick & Tile Co.
Carlyle Block—Carlyle Pav. Brick Co., Portsmouth, O.
Century Block—Metropolitan Paving Brick Co., Canton, O.
Chaldean (Hy-tex)—Hydraulic - Press. Brick Co., St. Louis and Chicago.
Chinchilla (Hy-tex)—Hydraulic-Press Bk. Co., Indianapolis.
Chocolate Special—Midland Bk. Co., Peru, Kan.
Citadel—Citadel Brick & Paving Block Co., Ltd., Quebec.
Claytex—Walton N. Cable, New York City.
Clayton Missions—Washington Brick, Lime & Sewer Pipe Co., Portland, Ore.
Clayton Velvets—Washington Brick, Lime & Sewer Pipe Co., Portland, Ore.
Cloister—Western Brick Co., Danville, Ill.
Colonial Reds—Belden Brick Co., Canton, O.
Coralmatt—Coral Ridge Clay Pro. Co., Louisville, Ky.
Coralruff—Coral Ridge Clay Pro. Co., Louisville, Ky.
Corduroy Velvet—Darlington (Pa.) Brick & Mining Co.
Coruga—Colonial Pressed Brick Co., Mogadore, O.
Corsweve—Thomas Moulding Brick Co., Chicago, Ill.
Coshocton—Coshocton (O.) Brick Co.
Craftsman—Pearl Clay Prod. Co., Bradford, Pa.
Crown—Green Fire Brick Co., A. P., Mexico, Mo.
Crucial—Crucial Fire Brick Co., Rome, Ga.
Cubans—Euclid Builders Supply Co., Cleveland, O.

Dabney—Dabney Brick Co., Galveston, Texas.
Darlington Rugs—Darlington (Pa.) Brick & Mining Co.
Denison—Mason City (Ia.) Brick & Tile Co.
Dutch—Dubois & Butler Brick Co., Falls Creek, Pa.

Egyptian Paving Block—Murphysboro (Ill.) Paving Brick Co.
Empire—Green Fire Brick Co., A P., Mexico, Mo.
Empire—Western Brick Co., Danville, Ill.
Everhard Antique—Everhard Co., Massillon, O.
Everhard Double-texture—Everhard Co., Massillon, O.
Everhard Fern-leaf—Everhard Co., Massillon, Ohio.
Everlasting—Mason City (Ia.) Brick & Tile Co.

Fallston Iron Spots—Fallston Fire Clay Co., Pittsburgh, Pa.
Fisklock—Fiske & Co., Inc., Boston and New York.

Ginger—Fraser-Myers Co., Dallas, Tex.
Greendales—Hocking Valley Pro. Co., Columbus, O.
Greendale Red Rugs—Hocking Valley Pro. Co., Columbus, O.
Greendale Rugs—Hocking Valley Pro. Co., Columbus, O.
Grid—Fiske & Co., Inc., Boston and New York.

Hanover Reds—Hanover Red Pressed Brick Co., Newark, O.
Hocking Block—Hocking Valley Brick Co., Columbus, O.
Holland Split—Thomas Moulding Brick Co., Chicago, Ill.
Homespun—Thomas Moulding Brick Co., Chicago, Ill.
Homestead—Farr Brick Co., Cleveland, O.
Hood's Pottry—B. Mifflin Hood Brick Co., Atlanta, Ga.
Hy-namel—Hydraulic-Press. Brick Company, St. Louis, Mo.
Hy-tex—Hydraulic-Press. Bk. Co., St. Louis, Mo.

Indian Head—Claycraft Mining & Brick Co., Shawnee, O.
Indiana Harvards—Indiana Brick Co., Anderson, Ind.
Ironclay—Iron Clay Brick Co., Columbus, O.
Ironstone Block—Terre Haute (Ind.) Vit. Bk. Co.

Keim—Keim Brick & Tile Co., Louisville, O.

McArthur Mission Brick—McArthur Brick Co., McArthur, O.
McArthur Rug Brick—McArthur Brick Co., Massillon, O.
Medal Block—Medal Paving Brick Co., Cleveland, Ohio.
Mexico, Mo.—Green Fire Brick Co., A. P., Mexico, Mo.
Metropolitan Block—Metropolitan Pav. Brick Co., Canton, O.
Milton—Milton (Ont.) Pr. Brick Co.
Montezuma Red Face—Montezuma (Ind.) Brick Works.
Mosaic—Western Brick Co., Danville, Pa.

Navajo—Kansas Buff Brick & Mfg. Co., Buffville, Kan.
Nelsonville Block—Nelsonville (O.) Bk. Co.
Nuvogue—Boone (Ia.) Brick, Tile & Pav. Co.

Old Hickory—Colonial Pressed Bk. Co., Mogadore, O.
Onondaga—Onondaga Vit. Brick Co., Syracuse, N. Y.
Old Rose Colonial—Montezuma (Ind.) Brick Works.
Olean Block—Sterling Brick Co., Olean, N. Y.
Oriental—Poston Paving Brick Co., Crawfordsville, Ind.

Pearl—Pearl Clay Products Co., Bradford, Pa.
Persian Split—Thomas Moulding Brick Co., Chicago, Ill.
Portage-Ruffs—Keller Brick Co., Cuyahoga Falls, O.
Porter National—Globe Brick Co., East Liverpool, O.
Poston Knobstone Block—Martinsville (Ind.) Brick Co.
Promenade—Yingling-Martin Brick Co., Johnsonburg, Pa.
Purington Pavers—Purington Pav. Brick Co., Galesburg, Ill.

Red Rock Ruffs—Auburn Shale Brick Co., Gettysburg, Pa.
Red Velvets—Indiana Bk. Co., Anderson, Ind.
Regal—Euclid Builders Supply Co., Cleveland, O.
Reynoldsville—Reynoldsville (Pa.) Brick & Tile Co.
Ridgway—Ridgway (Pa.) Brick Co.
Rocktex—Citadel Brick & Paving Block Co., Ltd., Quebec.
Roman Ante-Fired Process—London (Ont.) Pressed Brick & Tile Co., Ltd.
Ruftex—Thomas Moulding Brick Co., Chicago.
Rug—Hocking Valley Pro. Co., Columbus, O.
Rugosa—Wisconsin Lime & Cement Co., Chicago, Ill.
Rustic—(London (Ont.) Pressed Bk. & Tile Co., Ltd.
Rustico (Hy-tex)—Hydraulic-Press. Bk. Co., Davenport, Ia.
Rustique Oriental—Martinsville (Ind.) Bk. Co.

Saraband (Hy-tex)—Hydraulic - Press Bk. Co., St. Louis, Mo.
Shale-Tex—Streator (Ill.) Brick Co.
Shirvan (Hy-tex)—Hydraulic-Press. Bk. Co., Cleveland, O.
Shor-Wil—Shorey - Willis Bk. & Supply Co., Cincinnati, O.
Special—Green Fire Brick Co., A. P., Mexico, Mo.
Speedway Block—Alliance (O.) Clay Prod. Co.
Standard—Green Fire Brick Co., A. P., Mexico, Mo.
Steel Clay—Straitsville Impervious Bk. Co. New Straitsville, O.
Sykesville—Reynoldsville (Pa.) Brick & Tile Co.
Sun-Tex—Sun Brick Co., Ltd., Toronto, Ont.
Stranger Reds—Reynoldsville (Pa.) Brick & Tile Co.

Tamco Brick—T. A. Morrison & Co., Montreal, Canada.
Tapestry—Fiske & Co., Inc., Boston and New York.
Tavern Brick—Metropolitan Pav. Brick Co., Canton, O.
Templeton—Hay Walker Brick Co., Pittsburgh, Pa.
Textur—Thomas Moulding Brick Co., Chicago, Ill.
Texturesque—Diamond Brick Co., San Francisco, Cal.
Tiffany—Thomas Moulding Brick Co., Chicago.
Tiger Shale—Belden Brick Co., Canton, O.
Toronto—Toronto Fire Clay Co., Toronto, O.
Tosco—Lawhead Brick & Tile Works, Loogootee, Ind.
Turkestan—Beaver Clay Mfg. Co., New Galilee, Pa.
Turko—Rochester (Pa.) Clay Products Co.

Velour (Hy-tex)—Hydraulic-Press. Brick Co., St. Louis and Chicago.
Verd-Antique—Meacham & Wright Brick Co., Chicago, Ill.
Vertex—Beaver Clay Mfg. Co., New Galilee, Pa.
Vogue—Bessemer Fire Brick Co., Birmingham, Ala.
Volcanic—Beaver Clay Mfg. Co., New Galilee, Pa.

West Salem Matts—West Salem (Ill.) Hollow Brick & Tile Co.
Wire-Cut Lug Brick—Dunn Wire-Cut Lug Brick Co., Conneaut, Ohio.

We Can Save You Time, Money and Trouble on Fire Brick

BECAUSE OF

Quality, Price and Service

Freight Rates on all R.R.'s in UNITED STATES and CANADA

A Trial Shipment Will Convince You

Write Us

Alsey Brick & Tile Company, Alsey, Ill.

Fire Brick Facts For Kiln Builders

Do not overlook the quality of Fire Brick used in inner walls, crowns and fire arches of your kilns; this is all important. When fire brick begin to give away the whole kiln is impaired.

No brick construction will stand under strain of gradual contraction account of poor quality fire brick.

Consult us in advance of placing your orders.

Davis Fire Brick Co. Oak Hill, Ohio

Thomas Moulding Brick Co.

High-Grade Fire-Brick and
Special-Fire-Clay-Shapes
Press-Brick Enamel-Brick
Building-Specialties

CHAMBER-OF-COMMERCE BLDG-CHICAGO

FIRE BRICK

DOVER FIRE BRICK CO.

Incorporated 1870

— MANUFACTURERS OF —

Dover and Buckeye Fire Brick

Unexcelled for kiln purposes

509 CUYAHOGA BLDG. CLEVELAND, OHIO

The Toronto Fire Clay Company

Manufacturers of

"TORONTO" Smooth and Rough Textured Face Brick, Repressed Paving Blocks and Wire Cut Paving Blocks, with Lugs

TORONTO, OHIO

A. P. GREEN FIRE BRICK CO.

Formerly

MEXICO BRICK & FIRE CLAY COMPANY

MEXICO, MISSOURI

HIGH GRADE MEXICO FIRE BRICK TRADE MARK

Manufacturers of

High Grade Fire Brick

FOR ALL PURPOSES

Kilns a Specialty

Boiler Shapes of All Designs Made to Blue Prints

If You Believe Efficiency is a Factor

in the cost of production, there is no place it will show more than in the life and service of your kilns.

When building new kilns or preparing old ones, why not use material that will give best service, reduce repair bills, extend the life of your kilns, enlarge opportunities for increased output and swell profits?

We make a specialty of high grade fire brick for kiln construction, and special shapes for fire boxes, arches, flues and bottoms.

Consult us before buying.

Ten plants located on the Pennsylvania, New York Central and B. & O. railroads.

Jos. Soisson Fire Brick Company

General Office: Connellsville, Pa. *Sales Office:* Bolivar, Pa.

J. B. Hammond, Sales Manager

TRADE MARK

Belden Brick

CANTON, OHIO

THE BEST FACE BRICK MADE

ALL COLORS—FIVE FACTORIES

THE BELDEN BRICK CO.

CANTON, OHIO

The Ironclay TRADE MARK FIRE-FLASHED BRICK VITREOUS SELF-CLEANING It washes its own face.

The Ironclay Brick

has long been recognized as the standard by which all other Flashed brick are measured. For Composition, Richness of Color and Durability it is without a peer.

Standards, Romans, Normans in seven colors in Stock.

The Ironclay Brick Co.
COLUMBUS, OHIO

A sample of the information we are called upon to furnish:

Names of several Southern fire-brick manufacturers. Is to build a kiln. May 19.

Hollow tile manufacturers. Has recommended that material to a relative for a store building. May 4.

Manufacturers of hollow brick or building tile. May 11.

Wants to get in touch with silo tile manufacturers. May 16.

Names of two or three drain tile and sewer pipe manufacturers. May 17.

Several manufacturers of drain tile located in New Jersey. May 22.

Do you see what you are missing by not being represented in this department of "Brick and Clay Record"? Better start now.

Brick & Clay Record, Chicago, Ill.

William C. Crolius Co.

623 Continental and Commercial Bank Bldg. Chicago, U.S.A.

Sales Engineers for Paving Brick, Sewer Pipe and Clay Products

Promoters and Advocates of Plant Inspection and Acceptance. Mail us your views on this subject.

The Alliance Clay Product Co.

Manufacturers of the Famous

Speedway Block

Dunn Wire-Cut-Lug-Brick

Also High-Grade Building and Face Brick

ALLIANCE, OHIO

SHAWMUT VITRIFIED PAVING BRICK WORKS

SHAWMUT, PA. Alfred Yates, Gen. Mgr.

Vitrified Shale and Fire Clay Paving Bricks and Blocks

BURNED IN YATES' PATENT KILN

SAMPLES AND PRICES ON APPLICATION

"Best Paving Block Made"

DAILY CAPACITY, 500,000

The Metropolitan Paving Brick Co.

Canton Ohio

The Danville Brick Company

Manufacturers of

The Unsurpassed Danville Paving Block

DANVILLE, ILL.

Let Us Quote You Prices

Bessemer Limestone Company

Manufacturers of

Bessemer Block

Repressed & Dunn Wire-Cut-Lug

Youngstown, Ohio

The Harris Brick Co.

Manufacturers of

HARRIS PAVERS

Factory: Zanesville, Ohio

Office: St. Paul Bldg. Cincinnati, O.

A Uniform Block which makes an Ideal Pavement

THE BIG FOUR CLAY COMPANY
City National Bank Bldg.
CANTON, OHIO

Hocking Valley Brick Co.

Manufacturers of

Hocking Paving Brick

Repressed and Wire-Cut-Lugs, Dunn Patent

Plants: Logan, O. *General Offices:* Columbus, O.

Output 15,000,000 Annually

PURINGTON PAVERS

ARE MADE OF

GALESBURG SHALE

The Purington Paving Brick Co.

Galesburg, Illinois

Ironstone Block

"Often Rattled but Never Embarrassed"
Repressed and Dunn Wire-Cut-Lug

Terre Haute Vitrified Brick Co.

TERRE HAUTE, INDIANA

Sterling Brick Company

OLEAN, N. Y.

Manufacturers

OLEAN BLOCK WIRE-CUT-LUG

Made from shale VITRIFIED

Many are not as good
A few may be as good,
None Are Better

The United Brick Company

General Office: Greensburg, Pa.

Works: Conneaut, Ohio

Manufacturers of

Wire-Cut-Lug Paving Brick

(Dunn Patent)

A High Grade Paving Block for City Streets and Main Highways

The Medal Paving Brick Co.
Formerly
The Deckman-Duty Brick Company
Manufacturers of
MEDAL BLOCK
Repressed and Wire-Cut-Lug
CLEVELAND, OHIO

NATIONAL PAVING BRICK MANUFACTURERS ASSN. NPBMA Pave with Brick

Pittsburg Tile Mfg. Co.
MFRS. OF FLOOR TILE
DOMESTIC QUARRIES
Promenade Tile—
Cove Base, Angles, Caps, all sizes.
EAST LIVERPOOL, OHIO

Barr Paving Blocks
Repressed and Wire-Cut-Lug
Colonial Face Brick and Blocks
Barrtexture Face Brick
THE BARR CLAY CO.
STREATOR, ILL.

NATIONAL PAVING BRICK MANUFACTURERS ASSN. NPBMA Pave with Brick

ALLIANCE RUG BRICK

Excel all other brick as to texture and beauty of coloring. The chromatic scale of colors runs through the beautiful Rug-texture faces of these brick, most of the brick showing three or four or more of the seven primary colors. One of the most popular sellers in America today.

Mr. Agent, this brick will get you business. Write for samples.

The Alliance Brick Co., Alliance, Ohio

Murphysboro Paving Brick Co.
Manufacturers of
The Celebrated Egyptian Paving Block
The Block That Stands the Test
Prices and samples furnished upon application
MURPHYSBORO, - - - ILLINOIS
ALSO DUNN WIRE-CUT-LUG BRICK

L D. BINYON, President H. L. MATZ, Vice-President JAS. A. HOGAN, Sec'y and Treas.

S. S. Kimbell Brick Co.
Facing Brick, Mortar Colors, Raggle Blocks
Main Exhibit and General Offices: 304-306 Chamber of Commerce
Branch Exhibit and Sales Room: 738 South Michigan Boulevard
CHICAGO

PORTER-NATIONAL
an All Fire Clay Paving Block
Manufactured by
Globe Brick Company
East Liverpool, Ohio
Works at
Kenilworth, W. Va.

Hy-tex
The Standard of Quality in Brick
Every texture and color of brick may be found in the Hy-tex line. Send for information to the nearest Branch.
BRANCH OFFICES AND EXHIBIT ROOMS
Baltimore; Chicago; Cleveland; Davenport; Dubois, Pa.; Indianapolis; Kansas City; Minneapolis; New York City; Omaha; Philadelphia; Toledo; Washington, D. C.
HYDRAULIC-PRESS BRICK COMPANY
ST. LOUIS

THE JUNCTION CITY SEWER PIPE CO.
Junction City, O.
Standard Sewer Pipe,
Double Strength,
Wall Coping,
Chimney Tops, Stove Pipe,
Flue Linings, Thimbles,
Building Blocks,
and Other Clay Products

WHEN in need of "help" refer to our "Position Wanted" column. If what you want is not advertised there, instruct "Brick and Clay Record" to insert a suitable ad for you. Quick results.

American Clay & Cement Corporation ROCHESTER, N. Y.
Manufacturers of Clay Products
Distributors Face and Ornamental Brick-Masons' Supplies—All Indestructible Building Material

GOODMAN
STORAGE BATTERY
LOCOMOTIVE
ARTICULATED TYPE
For Plain Storage Battery Operation as Here Shown, or with Trolley Pole for Combination Service.

Carries the battery between two bogy trucks, distributing the weight over eight wheels and leaving all working parts perfectly accessible.

Two axles are driven and two are idle, protecting the motors by wheel slippage before overload can cause harm.

Wheel base for each truck is short and the articulated construction enables easy, rapid and safe operation on light rails and around sharp curves.

Numerous exclusive features of vital importance. *Write for Bulletin No. 521-A* (46)

GOODMAN MANUFACTURING CO., Chicago, Ill. Industrial Locomotive Dept.
New York Pittsburgh Cincinnati Charleston, W. Va. Birmingham St. Louis Denver Seattle

You will do better with an OSGOOD

The OSGOOD "18," ¾ yard Traction Revolving Shovel will mix the different stratas of your supply material with every lift of the bucket. It will enable you to get the material quicker, better and at much less expense.
We shall be pleased to give full description and detail information upon application.

THE OSGOOD COMPANY, MARION, OHIO
EASTERN OFFICE, 51 State St., Albany, N. Y.

Build with Brick

Durable Sheet Steel "Build with Brick" signs, either with or without your name. The price of steel has advanced considerably, but we can still furnish you signs out of stock at the old, low rate. White letters in dark blue background,—easily readable at a considerable distance. Increase the demand for brick and thereby enlarge your business, by the use of these signs. And remember, the old rate holds good only for our present limited stock. Better order some now. $5.00 per hundred for the plain sign; $6.00 per hundred for the larger sign, with an extra charge for imprinting your name.

BRICK AND CLAY RECORD
445 PLYMOUTH COURT, CHICAGO

Build with Brick
BELDEN BRICK CO.-CANTON

Your Transportation Department Will Be Respected by Customers and Competitors

THEY WILL NOTICE YOUR ABILITY to take care of business in many places they had never dreamed were possible to reach.

THEY WILL APPRECIATE THE PROMPT SERVICE, THE QUICK DELIVERIES and large tonnage that your transportation department handles.

FOR INSTANCE—averaging 50.86 miles and delivering 19,858 pounds of material each day during February, 1½ Ton Federal Truck No. 3225 earned for itself the respect and admiration of all its competitors, and enthusiastic praise from its owners.

WE WILL GLADLY SEND YOU INTERESTING DATA concerning Federal Trucks in the brick and clay-products business. We also publish "Traffic News" a magazine on transportation which we will be glad to send you upon request.

Federal Motor Truck Company
Detroit, Michigan
1½, 2 and 3½ Ton Worm Drive Motor Trucks

Moroney Says!—

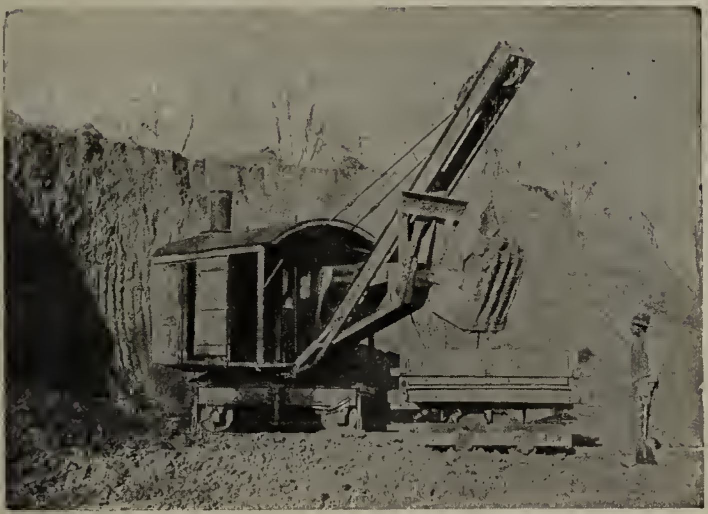
Clay workers find smooth sailing towards better and more uniform Product—when they use **The Chicago Piano Wire Screen.** The screen that "stops the stops." It pays for itself, then pays dividends.

Dry Press Machinery
Auger Machinery
Soft Clay Machinery

Supplies
of all kinds

Chicago Brick Machinery Company
20 W. Jackson Blvd. - - Chicago

1,653,000 Cubic Yards In 24 Years



Clay for 264,000,000 Brick in 9 Years With Type O THEW.

Clay for 397,500,000 Brick in 15 Years With Type 3 THEW.

Clay for 31,000,000 Brick in 1916 with Type 1 THEW and but half a day's delay during the year.

24 Years of Service and still operating and the owner writes: "The Shovel is not very handsome to look at but it does its work without any trouble. We can't say anything too good for the Shovel or for The Thew Company."

Over 300 Brick Manufacturers own THEW Shovels and will bear similar testimony.

239 THEW owners have given repeat orders.

In the face of such testimony, can you afford to employ old methods and have your output reduced by inability to get men enough in the clay pit to keep your plant running to capacity?

A THEW Shovel would save you time, money and trouble, increase the output of your plant and improve the quality of your product.

Circular 22-C shows you why and gives valuable data.
It is yours for the asking. Investigate The THEW. It Pays.

THE THEW AUTOMATIC SHOVEL CO., Lorain, Ohio

Put Half Your Wheeling Gang to Work on a Gravity Brick Conveyer

You won't need the other half.
Their salaries can be added to your profit.
You can save the cost of wheelbarrows also.

Catalog on Request

It's very simple—

Just put the brick on the steel, ball-bearing rollers—two, three or four at a time and let them run quickly and gently down into the car. Just a slight slant will cause the brick to run over the easy-running rollers for long or short distances, or turn corners, as desired. Made up in connecting sections for easy moving.

SPEED
MATHEWS GRAVITY CARRIER COMPANY
The Mathews Way
The Saving Way
ECONOMY

MAIN OFFICE AND FACTORY
ELLWOOD CITY, PENN.

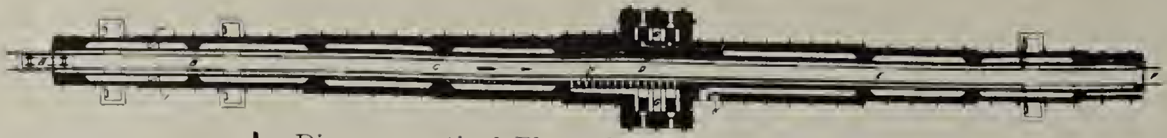
BRANCH FACTORIES:
TORONTO, ONT.
LONDON, ENG.

SAY I SAW IT IN BRICK AND CLAY RECORD

Would You Rather Travel In Relays Or Make a Continuous Journey?

Of course you'd rather get on a train in New York and go to Chicago without change than to change at Albany, Buffalo, Cleveland and Toledo. "Intermittent" traveling isn't very pleasant—neither is it economical in time or money.

Yet there is just as little argument in favor of burning clay products by the intermittent or periodical kiln. There is a great loss of time and waste of fuel—also tremendous wear and tear on kiln walls because of expansion and contraction. This was good enough until something better was devised and that's what you get in the



Diagrammatical Plan of Kiln for Burning High Grade Refractories.

Didier-March Continuous Railroad Tunnel Kiln

In this modern kiln you can burn any kind of clay products, have the temperature in each zone whatever you want and you'll get 100% quality of product, use less fuel, and burn in a great deal less time. The ware moves—the heat is constant—and it's the kiln of no repairs.

Didier-March Company, Perth Amboy, New Jersey

Contractors Manufacturers of Refractories *Engineers*

TRADE **SAWYER** MARK
Registered

Stitched Canvas
Belting
For Conveying

Waterproof and Grit-Proof—Raw Clay Does Not Harm It
Red Belt
Black Trade-Mark

Sawyer Belting Company
Cleveland

One Large Brick Plant Uses Four Sawyer Conveyors As Follows:

Raw Clay to Storage Building.
Storage Building to Dry Pans.
Brick Delivered from Auger Machine.
Waste Clay to Pug Mill.

TRADE **SAWYER** MARK
Registered

The Only "Best"

One Pyrometer is recognized as supreme today, the world over. It is the Brown High Resistance Pyrometer. Changes in length of wiring, and in atmospheric temperatures along the wiring have no affect on this improved Pyrometer. Give your Operator a direct reading Brown High Resistance Pyometer, and your temperature troubles will be over.

Our 72-page catalogue with 100 illustrations is sent on request.

The Brown Instrument Company
Philadelphia, Pa.

Oliver Bldg.
Pittsburgh

Hudson Terminals
New York

Webster Bldg.
Chicago

Distributing Material to Storage Pile or Spoil Bank

THE LOOP LINE TRAMWAY

with its continuous procession of barrows may be readily adapted to the distribution of material anywhere along the line by the simple expedient of equipping the barrows with drop bottoms, and the track with a movable tripping device, which automatically unlatches the bottoms at any desired point. This is but one of many services to which LOOP LINE TRAMWAYS are adapted.

Let Us Help You With Your Problem!

AMBURSEN COMPANY, 61 Broadway, New York City

BUILT FOR ENDURANCE

The first goal we sought in designing the "New Haven" Soft Mud Brick Machine was ENDURANCE. The second was CAPACITY. The question of cost did not enter into our plans and never has. We knew if we attained THESE two goals we would SOLVE the ECONOMIC problem.

The New Haven

therefore, stands today among all Soft Mud Brick Machines as the highest type of mechanical perfection.

Unlike those manufacturers who made the mistake of thinking first of COST and SERVICE later, we do not have to make excuses for the "New Haven."

We never have had a "New Haven" replaced by any other machine.

We never have had any complaints about repair bills.

We never have had any complaints about failure to give full service every day in the week—every week in the year.

The New Haven

costs a little more to BUY but manifestly LESS to RUN. This is true also with a well-made, all-wool tailored suit of clothes. And like the well-made clothes the "New Haven" LASTS LONGER and gives MORE SERVICE.

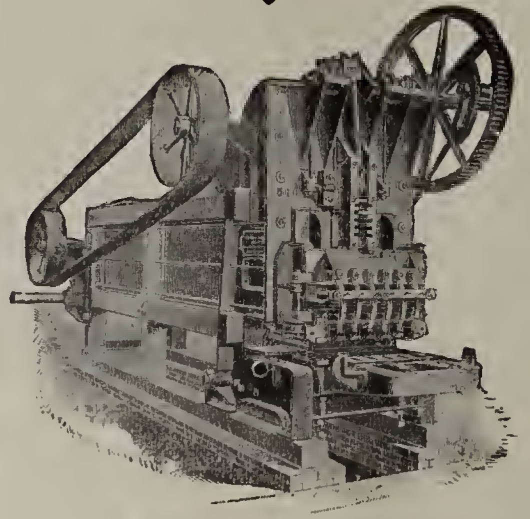
Figuring from a common-sense business basis the "New Haven" is cheaper after all.

We have a catalogue which tells all about the "New Haven". It costs you nothing to get it but the effort to ask for it.

The New Haven

A "New Haven" erected on a certain yard twenty years ago has been in continuous use, making an average of 1,000,000 brick per month.

Continuous results determine the economic value of a machine rather than first cost. The "New Haven," for that reason, proves the least expensive.



The Eastern Machinery Co.
New Haven, Conn.

The Eastern Machinery Co.
New Haven, Conn.

SAY I SAW IT IN
BRICK AND CLAY RECORD

Classified Advertisements

Classified advertisements are inserted at the following rates: First insertion, eight cents per word, the captions "For Sale," "Wanted," and address, to be counted as a part of the ad. Additional insertions, six cents per word per insertion. No advertisement inserted for less than $1.00 per insertion. Displayed classified ads in conformity with style prescribed at $3.25 per inch. Cash must accompany allorders.

WANTED—HELP.

WANTED—As a foreman, for a brick plant in Tennessee manufacturing 120,000 brick per day, a first-class, sober, young man, not afraid of a good, honest day's work, who knows how to handle men and who is thoroughly acquainted with the manufacture and burning of shale brick. One who has actually made good. Address: 6-Ben, care of "Brick and Clay Record." 6-2-2

WANTED—A burner for drain tile and dry-press brick in round down-draft kiln, with horizontal grates. Easy work, night and day shift. Yellow plastic clay burned red. Apply to Gladbrook Pressed Brick & Tile Co., Gladbrook, Iowa. 6-4

WANTED—General foreman for brick machinery plant making paving and face brick. Must be a mechanic. Give age, for whom worked, salary expected. Burke Brick Co., Ft. Smith, Ark. 6-2-2.

WANTED—An assistant burner for oil scove kilns. Booze fighters not considered. Marshall Brick Co., Marshall, Texas. 6-2-2.

WANTED—As a foreman, for a tile plant in Tennessee, who is a first-class, sober, young man, not afraid of a good, honest day's work, who knows how to handle men and is thoroughly acquainted with the manufacture and burning of sewer pipe and tile. One who has actually made good. Address: 6-Bat, care of "Brick and Clay Record." 6-2-2

WANTED—POSITIONS.

WANTED — Position as superintendent by ceramic engineer, over 20 years in the clay industry—12 years as kiln constructor and expert burner. Thoroly capable in the manufacture of building and front brick, hollow ware, drain tile, paving blocks and roofing tiles. Understand well how to handle labor, and how to keep machinery in good working condition. Best references. Address: 6-BX, care of "Brick and Clay Record." 6-2-3.

WANTED—Position by a practical brick man. Had 35 years' experience in manufacture of brick, both shale and clay, in the South. Never have failure in the burning. Can take care of all brick machinery, and handle labor both white and black to the best of advantage. Sober. Address: 6-B, care of "Brick and Clay Record." 6-2

WANTED—An experienced brick burner able to flash several shades without the assistance of chemicals. Plant runs with electric power and is provided with Raymond Gas Producer. References and terms required. Address: 6-BN, care of "Brick and Clay Record." 6-2-1.

POSITION WANTED—Ceramic and clay authority. Glazes, bodies, application, etc., technical training supplemented by 10 years' experience. Open after August 1st. Address: 6-A, care of "Brick and Clay Record." 6-1

WANTED at once, position as face-brick salesman with good company. Have had five years' successful experience; can furnish good references. Address: 6-BH, care of "Brick and Clay Record." 6-2-1.

WANTED—By competent, reliable man, position as head kiln burner. Address: 6-BB, care of "Brick and Clay Record." 6-2-1P.

MISCELLANEOUS

A GREAT OPPORTUNITY—For a practical man who thoroughly understands the making of building brick, drain tile, and hollow blocks. One who has some capital to invest in the reopening of a brickyard. Local parties would help finance the project. Address: 6-G, care of "Brick and Clay Record." 6-TF

ADDITIONAL OUTPUT — Sales organization, having sold up its present sources of supply, wants additional output on commission or straight salary basis. Only first-class clay products considered. Address: 6-BA, care of "Brick and Clay Record." 6-2-4.

KILNS A SPECIALTY

Want to contract brickyard work, kilns a specialty. Build round kilns as large as 36 ft., fire boxes, flues, stacks, all in harmony—scientifically figured, and guaranteed to work.

Geo. Ogan, 108 Logan Ave., Danville, Ill. 6-2TF

WANTED—EQUIPMENT

WANTED TO BUY—One dry pan, 9-foot; one wet pan, 8 or 9-foot; one sewer-pipe press. Give complete description, condition and cash price. Address: Lock Box 727, Uhrichsville, Ohio. 6-2-3

WANTED—A rotary sand-lime brick press, 12-mold Saginaw press preferred. State condition, price and location. Address: 6-X, care of "Brick and Clay Record." 6-TF

WANTED—To purchase 200 second-hand, double-deck steel drier cars. Give full description, name of maker and age. Address: 6-BO, care of "Brick and Clay Record." 6-2-2.

WANTED—Second-hand conical roll disintegrator. Sweetser Drain Tile Co., Sweetser, Ind. 6-2-4.

FOR SALE—SAND-LIME PLANTS

FOR SALE—Cheap, a complete sand-lime brick plant, tube mill, dryer, English rotary press. Will sell as a whole or any part of it. Write Albert H. Mueckler, Trustee, Manistee, Mich. 2-2-TF

FOR SALE—CLAYWORKING PLANTS.

FOR SALE—Modern Illinois brick and drain tile plant in good condition, with established trade in Northern Illinois, Northern Indiana, Southern Michigan, Southern Wisconsin and in Minnesota. Excellent railroad connections with good rates. Modern equipment thruout, consisting principally of five round down-draft kilns, 6-track steam dryer, dry pan, and newly installed No. 9 Brewer machine, practically unused. Power furnished by 100 h.p. steam boilers. Abundance of good clay is available.

Will either sell plant at reasonable figure or take on party willing to invest additional capital and assume the active management of plant. Address: 6-BD, care of "Brick and Clay Record." 6-2-2P.

FOR SALE—A good brick and tile factory in a good town of 3500 population in Indiana. The factory has never been able to meet the demand for its output. There is plenty of clay for many years and the plant is fully equipped with machinery, sheds and kilns. The shipping facilities are first class. This is an opportunity to get a bargain in a fine community. Address all communications to 5-BB, care of "Brick and Clay Record." 5-2-3

FOR SALE—A paving brick plant in the Mid-continent Gas Belt. Reputation of pavers worth more than the physical value of the plant. Will take part of purchase price in stock. Unlimited shale bed, plenty of natural gas. Plant built for oil, gas and coal. Brick business booming. Address: 6-H, care of "Brick and Clay Record." 6-5

FOR SALE—Red Face-Brick plant, making smooth reds and rough texture. Finest shale in Pennsylvania. At present in operation, with good demand for all output at good prices. Owner has other business requiring his time. This plant is located near Pittsburgh on Penna. Railroad and Baltimore & Ohio Railroad. Write for full particulars to 6-BE, care of "Brick and Clay Record." 6-2-1P.

FOR SALE—Brick plant fully equipped with modern machinery. Bargain, $4,500. Curwen L. Lutz, Perkasie, Pa. 6-4

OWNER WILL SELL whole or half interest in good paving brick and tile yard. B. E. Bechtel, Waterloo, Ont. 6-2-1.

BRICK PLANT FOR SALE—50 to 100 acres good quality clay. J. T. Wood, Williamstown, N. J. 6-2-10.

FOR SALE—SECOND-HAND MACHINERY.

FOR SALE

1 Stevenson 9 ft. dry pan.
2 Richardson steam represses.
1 Bonnot steam repress.
1 American large size automatic rotating cutter.
1 Berg 4-mold dry press.
1 Means wood-frame 9 ft. dry pan.
1 Freese Union brick machine.
1 Freese automatic rotating cutter.
1 Hetherington rattler, almost new.
70 Rack cars with steel pallets.
Irons for hot air dryer.
1 small concrete mixer.
1 Atlas engine, 14x26.

Address: Frank H. Robinson, 1230 Fulton Bldg., Pittsburgh, Pa. 6-2-1.

FOR SALE

Up-to-date Brick Plant located at Covington, Ky. Will sell any part, or all, building, grounds or machinery.

2 Lane & Bodley engines, one 150 h. p., one 200 h. p.
Duplex boiler feeder pump.
Small single acting pump.
200 inch fan, American Blower Co.
160 inch fan, American Blower Co.
8 inch by 10 inch upright engine.
Double engine, 7 inch by 72 inch.
Dynamo and switchboard, Edison.
Giant auger brick machine.
No. 20 automatic rotating brick cutter.
No. 29 pugmill.
Set smooth rolls, Bartlett & Snow.
Rust clay feeder.
Hacksaw, lathe.
Double emery wheel stand.
Lot of shafting, pulleys, belts, steam pipe and engine packing.
Bartlett & Snow rotating drier.
Several conveyors.

E. J. Winston, Masonic Temple Bulding, 7th & York Sts., Newport, Ky. 6-2p

FOR SALE—Note these bargains: 2 miles of 25 lb. and 5,000 ft. of 30 lb. rail at $1.30 per CWT. One 7x12 Vulcan 24 in. gauge Vulcan dinkey, $900; 26 Western 1½ yd. 24 in. gauge side-dump cars at $38.00. One ¾ yd. traction steam shovel, all overhauled, $1,850. Thew No. 0 revolving traction shovel, 3 years old, very fine condition, $2,425. One Monighan 1 yd. full circle dragline excavator on traction wheels, $3,000. Some model 60 Marion 2½ yd. shovels at $3,000. Both 4-wheel and 8-wheel standard gauge locomotive cranes, from 10 to 35-ton capacity for buckets. Confer with me. Tell me your needs and state what you have in surplus plant for sale. Willis Shaw, Railway Exchange Bldg., Chicago, Ill. 6-2-1.

FOR SALE—Complete outfit of machinery for a first-class shale-brick manufacturing plant. Inquiries solicited. Address: The Hibernia Bank & Trust Co., Denver, Colo. 6-2-2

FOR SALE—Four-mold Boyd press, seven foot Boyd dry pan. Quincy clay gatherer. East Olean Land Co., Inc., Olean, N. Y. 6-TF

FOR SALE

1 Anderson tile machine complete, with dies 3 to 18 in., and down delivery table.

1 Brewer tile mill complete, with dies 3 to 8 in.

1 Brewer cut-off table with friction helper.

1 Michigan disintegrator.

1 American smooth roll crusher.

1 Conveyor, 20 ft.

Line shafting, pulleys, barrows and trucks.

About 700 pallets for large tile. Ventilating slats to cover about 20,000 ft.; 1¼ by 2½ oak. Also complete power plant, 50 h.p. boiler and 35 h.p. engine. Supply tanks and feed-water heater. Also complete cider and jell outfit. Hydraulic press. This material is all practically as good as new, but can be bought at your own price, as lease is out on ground. Would consider placing this machinery in a new location with other parties or company and take stock for same. Will exchange for other property of value and pay or take difference Any inquiries for further information, write, phone or wire: R. C. Adair, Pioneer, Ohio. 6-2-1.

STEEL RAILS.

All sections, new and relaying, in stock for immediate shipment. Also FROGS, SWITCHES, SPIKES and BOLTS. We purchase old machinery, dismantle plants, and purchase scrap iron.

Let us know what you have to offer. Prices cheerfully quoted.

M. K. FRANK, Pittsburgh, Pa.

PATENTS

Inventions Protected.
Trade Marks Registered.
Patents Investigated.
Established 1895.

HUBERT E. PECK,
635 F. St., Washington, D. C.

BRICK MACHINERY LIKE NEW—One four-mold Boyd dry press, one two-mold Boyd dry press, Stevenson 9 ft. dry pan, one 1½ yard Bucyrus steam shovel, two Fate Special Premier brick machines with automatic cutter, American Ring Hammer No. 3 hammer crusher, two 72 in. by 42 in. Louisville wire clay screens, 60 h. p. gas engine, Phillips & McLaren 7 ft. dry pan. Full outfit of POTTERY MACHINERY. C. H. Horton Co., Painesville, Ohio. 6-1

FOR SALE—Two No. 36 American Ring Hammer Pulverizers: run only a short time. Address: L. L. Stephenson, Lovick, Ala. 4-2tf

FOR SALE—One 6 ft. single geared pug mill in first-class condition. Address: The Manufacturers Equipment Co., Dayton, Ohio. 6-2-1.

FOR SALE—Double arm, split, cast-iron, Jones & Laughlin pulley, 7 ft. diameter, 3 ft. face. 5 in. bore, in good condition. Offer subject to prior sale, at the low price of $85.00 f. o. b. cars, East Liverpool, Ohio. Address: The Golding Sons Co., East Liverpool Ohio. 6-1.

FOR SALE—One Wellington soft-mud brick machine having 35,000 daily capacity, and one 25 h.p. gas engine. One Raymond plunger press with equipment for making wire-cut brick and tile. All in working condition. New Ulm Brick and Tile Co., New Ulm, Minn. 6-2

FOR SALE—3-mold Boyd press, good order—$375.00. Potts 10 ft. pug mill—$38.00. 12 ft. 10-inch belt conveyor—$22.00. One stiff-mud machine (horse power) and 25,000 pallets—$95.00. Industrial Supply Co., Keokuk, Iowa. 6-2-1.

FOR SALE OR TRADE—Complete equipment for a stoneware pottery, Eagle 7 ft. dry pan, and Potts soft-mud machine and pallets. Address: 3-P, care of "Brick and Clay Record." 3-TFX

RAILS
Locomotives, Cars, Etc.
Bought & Sold
Walter A. Zelnicker Supply Co.
in St. Louis

23 1st Nat'l Bank Bldg.
Chicago

Send for our Bulletins

FOR QUICK SALE—Martin soft-mud machine, new 1914. 5,500 steel pallets, Martin dryer complete except steam pipe (33,000 capacity). Address: L. Bx. 161, Harrisburg, Pa. 6-3

PROPERLY REBUILT MACHINERY IN STOCK—Boilers: Stationary, firebox and vertical, all sizes, high and low pressure. ENGINES: Corliss, automatic, throttling, gas and gasoline. GENERATORS and MOTORS: All sizes and kinds. HEATERS, PUMPS, valves, pipe, belting, saw mills, woodworking and iron-working machinery. Sole manufacturers of the celebrated "LEADER" INJECTORS and EJECTORS. Send us your requirements. We can fill them. The Randle Machinery Co., 1733 Powers St., Cincinnati, O. 5-2-TF

Can
You
Use
Used
Machinery

If so, keep your eye on the Classified Department. It offers you constant opportunities of cheaply purchasing used machinery and equipment.

Brick and Clay Record

Which Do You Prefer?

Real Cash in the Bank or Unredeemed Cash in the Junk Pile?

Of course we know your choice—at least in thought—

But why don't you act?

Right now is an ideal time for you to dispose of such machinery and equipment as you have discarded—it would be wise even for you to advertise that which you will soon displace with the new machinery you have ordered.

Some brother manufacturer may want just what you have been compelled to replace.

We Can Help You Sell It—a small ad in our Classified Columns has done it for others—it can do it for you, too.

Only 8 cents per word for first insertion—6 cents per word thereafter.

Brick and Clay Record
Classified Advertising Department
445 Plymouth Court Chicago

Why Be
Discouraged
When the

"PROCTOR"

Will Solve
Your Drying
Troubles

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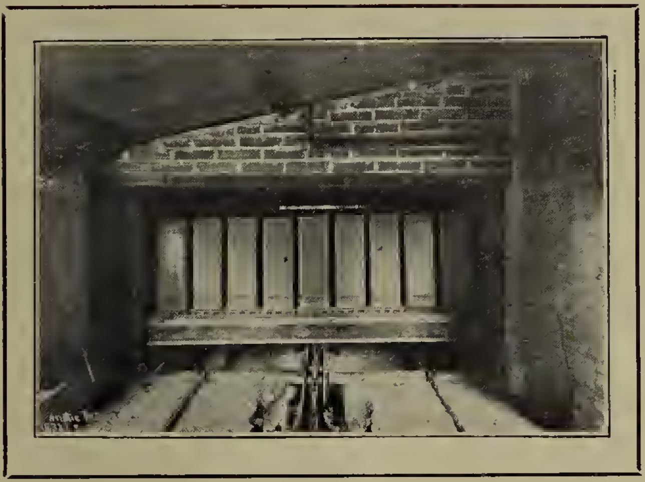


Let's take, for instance, a plant making various sizes of tile, say from 4 in. to 30 in. The greatest trouble such a plant will have is in its dryer because there's a world of difference in the method that must be employed to dry the smaller or the larger sizes. There's a tremendous waste on tile plants just because their drying methods compel them to use practically the same methods for all sizes.

But those who have the "Proctor" Dryer never know any such troubles because there is absolute control of both temperature and air flow—it's easy to regulate both with perfect ease.

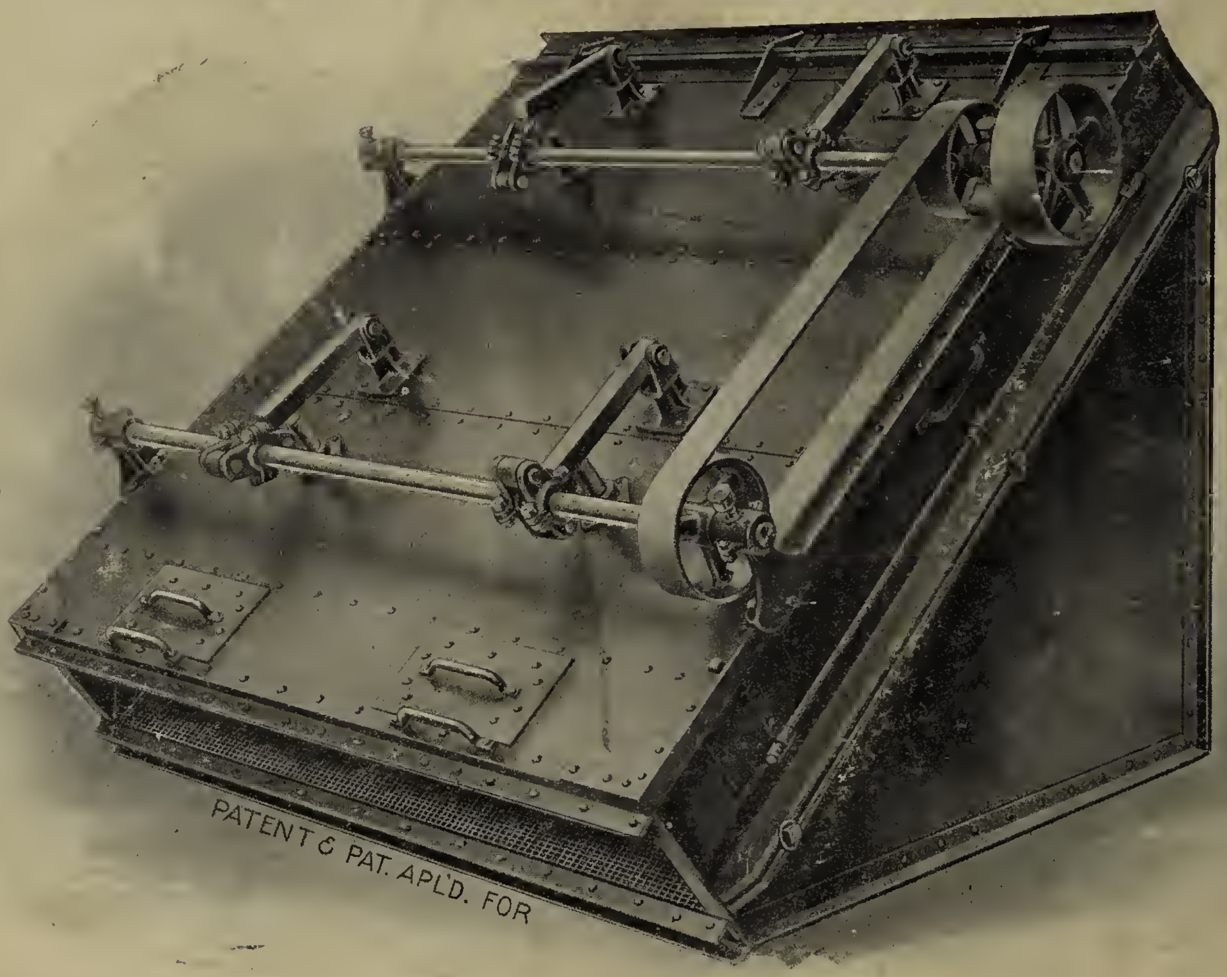
One of our engineers—expert in drying of all kinds of clays—will gladly go to any tile plant to consult with you on your drying troubles. And this will entail no obligation on your part.

THE PHILADELPHIA TEXTILE MACHINERY COMPANY

Hancock and Somerset Streets
Philadelphia, Pa., U. S. A.

SAY I SAW IT IN
BRICK AND CLAY RECORD

STURTEVANT
Newaygo Clay Screens



Produce an accurate product through a square mesh wire cloth, no slivers or coarse particles can pass its surface and spoil the uniformity of a high grade brick.

Difficult to Clog

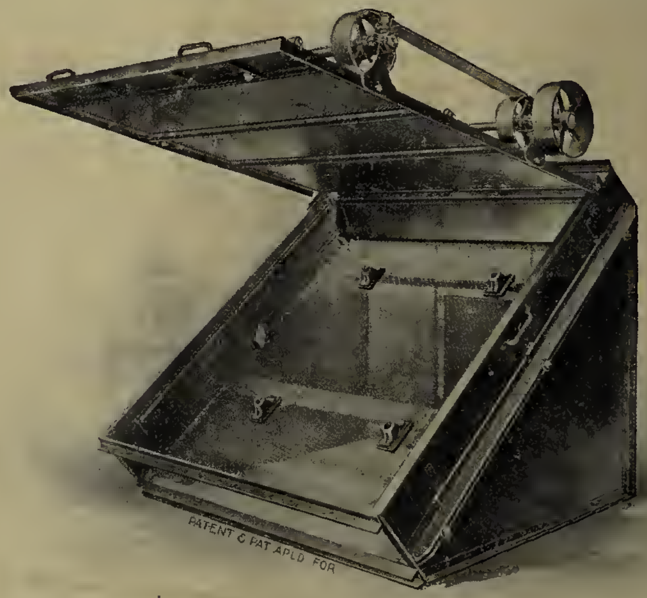
Because:—The screen surface is square mesh wire cloth which is mechanically rapidly vibrated, not shaken or bumped by eccentrics, but tapped by hundreds of little hammer blows upon its re-enforced surface, thus preventing anything from wedging or sticking in its meshes. The screen wire is stretched taut and held taut to make this continuous and rapid vibration possible.

It is a well known fact that wire cloth set at a 45 degree angle produces a product twice as fine as a flat screen of the same mesh, therefore a 6-mesh screen cloth on the Newaygo gives an accurate 12-mesh output. Large openings are difficult to clog and open meshes mean large capacity. Heavy wire used with coarse meshes is durable.

Newaygo Screens are rapidly replacing the piano wire and slotted screen types.

Used by many large Brick Manufacturers.

Built in several models and sizes.



Send for Catalogue 77E.

STURTEVANT MILL CO., BOSTON, MASS.

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